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## THE ROLE OF FOOD IN CORONARY ARTERY DISEASE.[1]

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NOBODY, these days, doubts the importance of disease of the coronary arteries. All too frequently death in this guise has visited our circles of relations and friends, seeming always to stab closer and closer as our own years advance. Nor is this just a figment of our fearful imagination, as is amply testified by official statistics. Among the Australian male population, coronary artery disease is so prevalent as to account for more than 5% of all deaths and for more than 20% of the deaths which occur during the working period of life (Hipsley, 1957), and so to confer on Australia the unenviable honour of ranking second among the countries of the world in the coronary mortality lists (Yudkin, 1958). Coronary heart disease is one of the major hazards which lie ahead of the middle-aged civilized man of today—greater even than the risk of developing a peptic ulcer, of dying of lung cancer, of being severely injured in a traffic accident or of being committed to the care of a mental hospital, all of which are the commoner fates which lie in store for us (Morris, 1957).

These facts in themselves are sufficiently alarming to stimulate inquiry into the causes and possible means of reducing the ravishes of coronary artery disease. But the situation is even worse, in that the incidence of the disease is increasing, having doubled or even trebled in some age groups over the last ten years (Martin, 1956). Thus, although more of us are being spared for life by virtue of the decrease in infant mortality, and although life of today has more than ever to offer for our enjoyment by way of material comforts and freedom from many ills, yet we are threatened increasingly with premature destruction. Why? Which of our civilized habits transgress the natural laws of health? Could there be something offensive about our food?

### Annie B. Cunning.

One recent victim of the disease who would certainly have approved of an inquiry being made along the lines of nutrition was Dr. Annie B. Cunning, the founder of this annual lectureship, which I have the honour to hold this

[1] The Annie B. Cunning Lecture on Nutrition, delivered before The Royal Australasian College of Physicians on March 20, 1959, at Hobart.

year; for, on December 4, 1958, Annie Broomhall Cunning died in London from coronary thrombosis after a life of more than three score years and ten which had begun in Birkenhead before the dawn of the coronary era. Soon after graduating in medicine from the Royal Free Hospital, she married in 1906 Joseph Cunning, an Australian surgeon, who practised in Wimpole Street and was on the staff of that hospital. In 1931 she and the other members of her family visited Australia, and then, in 1935, as a result of a visit to Switzerland, she became interested in the treatment of disease, especially arthritis, by nutrition, and clinical trials were encouraged in the Royal Free Hospital. It is quite clear from the two books she published—"We Are What We Eat" and "Eat, Drink and Grow Clever"—that she subscribed in good measure to the belief of her co-author, Dr. Flora Innes, "that Malnutrition is the root of all evil", and that wholesome, natural food is an essential item for good health.

In 1942 Annie Cunning founded this lectureship on nutrition "for the promotion and encouragement of medical education and the dissemination of knowledge". The first lecture, entitled "The People's Food", was given by Dr. C. H., later Sir Charles, Kellaway in 1943; tonight it is my privilege to give the twelfth lecture, the first after her death. It seems particularly fitting that the topic I chose, which reflects the interests of the workers with whom I am honoured to be associated, should deal with the possible role of food in disease—a subject which fascinated Dr. Annie B. Cunning during her life—and that the disease under scrutiny should be the one which closed her life.

### Clues to the Cause of Coronary Artery Disease.

What possible role could food play in this tragedy of a high and rising incidence of coronary artery disease in our country? We must search for clues among the known facts of the disease, so let me refer briefly to the relevant items.

Coronary artery disease clearly has a predilection for the male sex, its attack rate rises with age, it is commoner among members of the higher social classes, among those who bear responsibilities, among the physically inactive, among smokers, among the obese, among hypertensives, among certain families and those with myxœdema, nephrosis, diabetes and xanthomatosis, and it is commoner in people who indulge in the so-called civilized way of life than in those who retain their primitive native habits. No theory of cause is completely acceptable unless it explains these associations. But it is possible that the list can be whittled down. For example, evidence is accumulating that differences in physical activity account for the relation of incidence to social class, to the stress of responsibility, perhaps to smoking, and in some degree to obesity (Brown *et alii*, 1957; Morris and Crawford, 1958). The familial occurrence of the complaint and its association with certain other diseases are linked with disordered lipid metabolism. Age, of course, is always difficult to incriminate, because inevitably it includes the cumulative or protracted effects of any primary factors such as hormones, blood pressure or lipid abnormalities. Racial differences, too, can mask a Pandora's boxful of items, many of which may be playing an influential part, from genes to food to physical activity and disease. Perhaps, then, we are left with sex, age, exercise, obesity, blood pressure, lipid disorders and race.

Leaving these clinical or external associations and looking deeper, at the diseased coronary arteries themselves, we find atheroma and clot. Atheroma is undoubtedly found in the vast majority of instances where there is ischæmic heart disease, and it is more severe than in persons who do not suffer from this disease. However, the relationship is not exact. Whereas the incidence of coronary thrombosis and myocardial infarction has increased in Britain, Morris (1951) found no evidence of a concomitant increase in atheroma, and indeed, it looked as though coronary atheroma might have declined during the same period. Nor does the prevalence of atheroma vary with physical activity or occupation, even though death from coronary disease is twice as common among light workers as among heavy workers (Morris and Crawford, 1958). The Bantu and other races who are relatively free from clinically evident coronary heart disease are by no means free of atheroma (Laurie and Woods, 1958; Holman *et alii*, 1956). And though atheroma can be induced quite easily in animals, myocardial infarction is practically unknown. Obviously, there is something in addition to atheroma—thrombosis, most likely.

The essential features of atherosclerosis are intimal fibrosis and accumulations of lipid. The lipids which are deposited are similar in composition to those which circulate in plasma (Weinhouse and Hirsch, 1940), and it is generally believed that they are derived by filtration, forced by the blood pressure, across the endothelial barrier (Page, 1954). Atherogenesis will be accelerated by an increased concentration of lipid in the plasma, especially if the lipid molecules are big, unstable and likely to become bogged within the arterial wall, and by increased blood pressure. There may be some abnormality in the wall of the artery facilitating an influx of lipid, or even manufacturing it, or causing it to be deposited or become insoluble, or hindering its onward passage into the lymphatic channels. These local factors, including traumatic damage as from the continual bending of mobile arteries or the impingement of jets of blood, determine the sites of atheromatous plaques. As age advances and atheroma becomes more severe, the lipid content of the arterial wall increases, especially cholesterol.

Obviously, we must pay some attention to the lipids as they circulate in the plasma. Lipids in plasma comprise fatty acids, triglycerides, phospholipids and cholesterol and its esters; but the most consistent association between any of these and coronary artery disease concerns cholesterol. The disease is unusually prevalent in at least one condition which is characterized by hypercholesterolæmia — namely, familial xanthomatosis — and perhaps also in others — diabetes, myxœdema and nephrosis. Then again, numerous surveys have found that subjects who are known to have had ischæmic heart disease have, on the average, higher serum cholesterol levels than control groups. Those are retrospective studies, in that measurements were made in patients after they had developed clinical evidence of disease. More convincing evidence comes from the prospective study being made in Framingham, Massachussets (Dawber *et alii*, 1957). There, after serum cholesterol content had been measured in a large number of subjects, follow-up inquiries showed that men with high cholesterol levels developed ischæmic heart disease five or six times more commonly than men with low levels. The overlap between groups with and without the disease is so great that the cholesterol level cannot be used to predict the future for any particular individual. Nevertheless, there is this definite, many-times-confirmed suggestion of an association between plasma cholesterol content and coronary artery disease.

Cholesterol, like the other lipids, is insoluble in water. A very small amount is carried in chylomicrons, emulsion particles of fat which are seen after a fatty meal; but the great bulk of cholesterol is carried, together with other lipids and proteins, in the complex water-soluble molecules known as lipoproteins. These belong to two classes; alpha lipoproteins are smaller, heavier and more stable and soluble, while beta particles are larger, less dense and less soluble (Oncley, 1954). One method of separating alpha from beta lipoproteins is by paper electrophoresis; elution of cholesterol then shows, in Australians, that 78% of the serum cholesterol is in beta and 22% in alpha lipoproteins (De Wolfe and Whyte, 1958). It is the beta class of lipoproteins which is accused of playing a role in coronary artery disease; sufferers have more cholesterol in their serum because they have more beta lipoprotein.

Apart from these lipid aspects of coronary artery disease, we must briefly refer to the thrombotic aspects. Thrombosis is sometimes apparent, and can be seen to have caused the final blockage of the artery. However, Duguid (1954) has taken the matter much further by

finding support for the old theory of Rokitansky that thrombi may be the cause rather than simply the result of atherosclerosis. It is claimed that endothelium grows over the thrombi, thus incorporating the fibrin deposits into the wall of the artery, and that lipid deposition and necrosis are secondary occurrences. Be that as it may, thrombosis undoubtedly plays a role in this disease we are considering, so that we must keep in mind all the factors which affect the production of thrombi, the clotting of blood and the fibrinolytic removal of these intravascular impediments.

In summary, then, the backdrop against which we must view this coronary artery performance and attempt to see any role being played by food might appear as in Figure I. Ischæmic heart disease is our main concern.

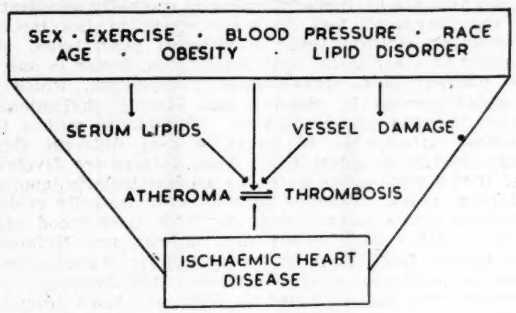


FIGURE I.
Important factors in the production of coronary artery disease.

Atheroma and thrombosis seem to be wicked partners in the crime, standing close to the scene of the tragedy. Accomplices in the background are serum lipids, represented by beta lipoproteins, and flaws in the intimal lining of the vessels, such as may arise from the buffeting of the blood pressure. Circumstances which we presume are encouraging to this train of criminal activity include the male sex, increasing age, physical inactivity, obesity, raised blood pressure, disordered serum lipids and the habits or nature of civilized beings.

The probability that the food we eat plays a part in this performance is obviously very high. The importance of discovering the truth about food and other possible causes is that steps may then be taken to halt or even reverse the suicidal procession in which we are involuntary participants. One of the major revolutions in medical thinking has been the realization that atheroma and arterial disease may not be inevitable accompaniments of growing old, but that they may be preventible and reversible.

Food may conceivably be important because of its quality—that is, composition—or quantity—excess or deficiency. I intend dealing with one aspect of quality—namely, dietary fat—and one aspect of quantity—namely, excess of food, which leads to obesity. In doing so I will draw largely on the results of observations made by workers of the Kanematsu Institute among natives in New Guinea and Australians, as the more general aspects of these problems are adequately reviewed elsewhere (Bronte-Stewart, 1958; Proger, 1958).

### Fatty Food and Coronary Artery Disease.

Early experimental work focused attention on the production of atheroma by cholesterol feeding; but it soon became clear that man did not behave like the rabbit, in that man's serum cholesterol level was scarcely affected by cholesterol feeding. However, interest in dietary factors was reawakened by the pronounced decrease in the incidence of ischæmic heart disease, in atheroma and in serum cholesterol levels which occurred in wartime, and this was thought to be related to the decreased consumption of various foodstuffs, especially fatty foods. Fats came under scrutiny. That serum cholesterol level was directly influenced by the amount of fat in the diet was shown by a number of workers; but whether this meant parallel changes in atherogenesis and the likelihood of developing ischæmic heart disease remained a matter for conjecture.

Epidemiological surveys have provided indirect evidence that this is so. Primitive races like the South African Bantu and our neighbours in New Guinea eat little fat, have low serum cholesterol levels and little atheroma, and rarely develop ischæmic heart disease. By contrast, Australians and other races whose diet contains much fat have a high average serum level of cholesterol, develop a great deal of atheroma and have a high incidence of coronary catastrophes. In general, it would seem that the incidence of coronary disease in different countries is roughly proportional to the dietary intake of fat; so, too, is the average serum level of cholesterol in the population. More valuable than these international comparisons are intraracial studies, such as have been made on different sections of the Yemenite Jews in Israel, and surveys on different groups in the one community, such as the Bantu, Cape Coloured and European residents of Cape Town. The results have confirmed the general thesis.

Exceptions to a simple relationship between fat intake, cholesterol level in the serum and coronary artery disease have been observed, and one possible cause of such discrepancies has emerged from experimental work. Cholesterol level depends not simply on the total amount of fat ingested, but also on the type of fat in the diet. Most fats of animal origin will raise the serum cholesterol level, while most fats of vegetable origin will lower it. But it is not solely a matter of animal versus vegetable; oils from marine animals, for example, lower the cholesterol level, and coconut oil raises it. Opinions differ on the exact nature of the chemical basis for these contrary effects of fats; but the most convincing evidence to date suggests a relationship to the state of saturation of the fat—that is, its iodine number (Ahrens *et alii*, 1957; Ahrens *et alii*, 1959). Foods containing fats with low iodine numbers, such as butter, eggs, meat and margarine, raise the serum cholesterol level, while fats which are highly unsaturated, such as sunflower seed oil, corn oil and peanut oil, lower the serum cholesterol level. The changes in total cholesterol level reflect changes in the concentration of beta lipoproteins. And, finally, it is claimed (Bronte-Stewart, 1958) that the mortality from coronary disease in different countries correlates with the ratio of saturated to unsaturated fats, rather than with the total bulk of fats, which are consumed.

So far, the evidence against fat, saturated fat, looks convincing. The consumption of saturated fats raises the serum cholesterol level, which in turn promotes coronary artery disease. However, proof of this sequence is not yet forthcoming, and the circumstantial evidence on which the theory is built has been seriously criticized. The wartime experience of deaths from coronary disease in the United Kingdom did not run parallel to fat rationing; deaths from diseases other than coronary heart disease also declined in occupied countries during the war; and there were many changes besides fat consumption at that time, such as a reduced total caloric intake, increased activity and less obesity. Epidemiological evidence must always be accepted with caution because of the many unrevealed points of difference between racial and geographically distinct groups of people. Yudkin (1958) has found no clear relationship between coronary mortality and fat consumption, either between different countries or within one country over a number of years; indeed, the trend in coronary mortality in Great Britain followed more closely the number of radio and television licences than changes in fat or any other dietary factor. A similar discrepancy has been demonstrated for Australia (Hipsley, 1957)—a rising annual death rate from coronary disease without any appreciable change in the consumption of animal fats or fats of all kinds. Nor can differences in cholesterol levels within our community be accounted for solely by differences in fat intake. Dietary studies on two groups of

Australian men in the same occupation, one with high levels of cholesterol and the other with low levels, showed that both groups had the same intake of total calories, fat and cholesterol (Whyte *et alii*, 1958); genes and other factors play their part.

Despite the shakiness of a lot of the observations, there is overwhelming evidence for some sort of association between coronary artery disease and serum level of cholesterol or other related serum lipids, and between serum level of cholesterol and dietary fat intake. What do we find when we compare Australians, whose consumption of fat and incidence of coronary disease is high, with natives in New Guinea, who eat much less fat and who do not suffer from coronary disease? Incidentally, the natives who were studied had the same bodily bulk relative to height as the Australians, though they naturally differed in many other respects. Differences in serum lipids are shown in Table I (Goldrick and Whyte, 1959). Australians have a higher concentration of cholesterol, carrying more in both beta and alpha lipoproteins, a higher concentration of phospholipids and a higher ratio of cholesterol to phospholipid; but a lower proportion of the total cholesterol level is carried in the beta fraction. On the basis of various published assertions, the Australians would be expected to be more atherogenic because of their higher cholesterol level, beta cholesterol level and cholesterol-phospholipid ratio, but the natives might be expected to be adversely affected to some extent because of the high percentage of beta cholesterol.

TABLE I.

*Differences in Serum Lipids of Male Australians and Natives in New Guinea.*

| *Observation.* | *Australians.* | *Natives.* |
|---|---|---|
| Total cholesterol content (mg. per 100 ml.) | 207 | 167 |
| Total phospholipid content (mg. per 100 ml.) | 228 | 210 |
| Cholesterol-phospholipid ratio | 0·91 | 0·78 |
| *Alpha lipoprotein content (mg. of cholesterol* per 100 ml.) | 44 | 29 |
| Beta lipoprotein content (mg. cholesterol per 100 ml.) | 164 | 139 |
| *Beta lipoprotein content (percentage of* total cholesterol) | 78 | 83 |

It would be presumptuous to insist that differences in dietary fat intake are the cause of these differences in serum lipid levels. However, the differences are not present at birth. The new-born of both races have a serum cholesterol level of about 70 mg. per 100 ml. This rises to 150 mg. per 100 ml. during the first few months, when breast milk is providing the nourishment, and then gradually the levels in the two groups diverge towards the adult concentrations (Whyte and Yee, 1958). With advancing age the level of cholesterol in the natives remains practically constant, while the level in Australians, as in civilized people generally, increases (De Wolfe and Whyte, 1958). Apart from these quantitative differences, there are also qualitative differences in lipids between the two racial groups. Cholesterol transport differs, in that any increase in total cholesterol content in the serum of Australians is borne solely by the beta lipoprotein fraction, the alpha fraction remaining constant, while increments in cholesterol content in the natives are shared by both alpha and beta lipoproteins (De Wolfe and Whyte; Goldrick and Whyte, 1959). Thus, as total cholesterol content increases, the percentage carried in beta particles increases among Australians, but remains constant in the natives. Furthermore, there is evidence that the composition of the lipoprotein fractions in respect of their content of cholesterol and phospholipids is unusual in the natives. These observations indicate fundamental racial differences in cholesterol metabolism and warrant further investigation. Whether they have any bearing on the relation of lipids to vascular disease, or whether they are due to differences in diet, diseases or genetic constitution, remains to be discovered. Dietary factors other than fats, such as protein, may be important.

So much for the relation of dietary fat to serum lipids; what of its effect, if any, on other factors likely to encourage ischæmic heart disease? Although there is a good deal of correspondence in the epidemiological patterns of coronary artery disease, serum lipid levels and hypertensive disease, no association has been demonstrated to exist between cholesterol and blood pressure. This applies to our own observations in New Guinea and Australia as well as to those of others elsewhere. There is evidence, however, for an association between dietary fat intake, serum lipids and blood clotting. This has been thoroughly reviewed by O'Brien (1957) and Poole (1958). Some fatty substance normally present in plasma plays an essential role in the clotting of blood. The ingestion of fat, whether saturated or unsaturated, accelerates blood clotting in at least some of the many tests which are available. Clotting is markedly accelerated in the "Stypven" test, to some extent in the test of whole-blood clotting time in siliconed glass tubes, and possibly in other tests. One accelerating factor is one of the phospholipids, ethanolamine phosphatide, which is probably present in platelets and also in chylomicrons which increase post-prandially. Thrombosis within the coronary arteries is, of course, a very different thing from clotting in a test tube; many factors are involved, and it is a topic about which we are particularly ignorant (O'Brien, 1958). However, patients with clinically evident coronary artery disease clear fat from their blood after a meal rather more slowly than normal, and McDonald and Edgill (1957) found hypercoagulability of the patients' blood in the fasting state as compared with controls. This, however, was not confirmed by O'Brien. Apart from the formation of thrombi, the lysis of thrombi is also important, and there is experimental evidence to suggest that fats inhibit fibrinolysis.

Assuming that clotting times reflect the likelihood of thrombosis, and that thrombosis is a feature of atherogenesis and the production of ischæmic heart disease, then one might expect that the blood of Australians would clot more readily than that of our primitive neighbours. In fact, the reverse is the case (Goldrick and Whyte, 1958). In both the "Stypven" test and the whole-blood clotting test, the natives demonstrated greater blood coagulability (Figure II). At least part of this difference is attributable to differences in the lipoprotein distribution. In both the native and Australian observations, analysis revealed that alpha lipoprotein appeared to be inhibiting coagulation in the "Stypven" test, while beta lipoprotein might be accelerating it in the manner illustrated in Figure III. The response to fat-feeding in the natives is not known; nor has their fibrinolytic activity yet been studied.

Other investigations made among Australians by Goldrick (1959) have shown that patients known to have arterial disease have shorter "Stypven" times than do healthy young control subjects—which might be expected from the fact that patients usually have more beta and less alpha lipoprotein than normal. A standard fatty meal produced the usual changes in serum lipids and shortened both the "Stypven" time and the whole-blood clotting time in patients and controls. When patients were kept on a diet containing unsaturated oil, the concentrations of cholesterol and of beta lipoproteins were depressed, and the whole-blood clotting time was prolonged in the patients, but not in the controls.

In summarizing this section, we can say that if all these implications are true, then dietary fats have a good deal to answer for, and so have the food purveyors, and so have we, the willing consumers. Perhaps they contribute to our high and rising incidence of coronary disease, to racial differences and to the increased risks incurred by the obese and by the well-fed members of the higher social classes. If we care to extrapolate the available indirect evidence, in the manner of the popular Press, ignoring various criticisms and contradictory observations, then we can aver that fats adversely affect the serum lipids and encourage atherogenesis, thrombosis and ischæmic heart disease, and that every fatty meal is a

risky adventure. But the case against fats is far from being clear cut and sealed, and there is, as yet, no guarantee that a change in dietary habits with the accompanying decrease in serum cholesterol content and beta lipoproteins would lower the incidence of coronary artery disease. Nevertheless, it is a satisfying, thought-provoking experience to watch cutaneous xanthomata disappear under this treatment, and to wonder what is happening in the coronary vessels.

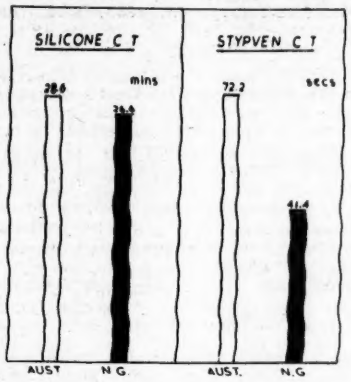


FIGURE II.
Blood clotting times in Australians and natives in New Guinea.

### Excess Food and Coronary Artery Disease.

Excess food leads to obesity, and the obese die prematurely from a number of causes. That ischæmic heart disease is one of these and is uncommonly prevalent

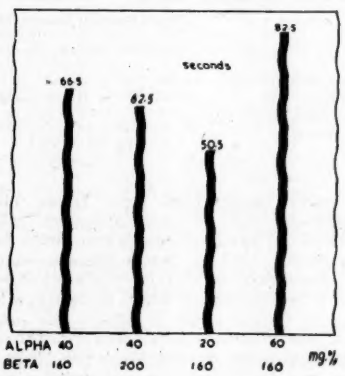


*FIGURE III.*
The effect of alpha and beta lipoproteins on the "Stypven" clotting time.

among fat people rests mainly on the accumulated evidence of insurance companies, and is generally accepted as being well established (Gubner, 1957). However, while some studies have purported to confirm this opinion (French and Dock, 1944), others have found no bias towards overweight in subjects with myocardial infarction (Yater *et alii*, 1948; Garn *et alii*, 1951). This conflict in views extends from the clinical aspects to the pathological. Wilens (1947) found at autopsy that overnutrition, quite apart from hypertension and age, was associated with an excessive degree of atherosclerosis, especially in males and in coronary vessels. On the other hand, Faber and Lund (1949) found no difference attributable to body weight when the influence of hypertension was taken into account.

If the obese are truly prone to develop coronary artery disease, then it becomes of interest to know whether obesity exerts this influence through an effect on the serum lipids, or on blood clotting, or on blood pressure. It is common experience that an individual's serum cholesterol level increases while he is putting on weight; but once again there are conflicting opinions of the relation of a steady state of obesity to the serum cholesterol level. There is one very good survey, which shows a positive correlation between the thickness of subcutaneous fat and the cholesterol level (Tanner, 1951); but the majority of studies have disagreed with this. Our own studies, both in New Guinea and Australia, have showed no association.

Obesity is not easily measured, and the term is frequently used when really overweight is meant. There are two bodily measurements we are interested in: total bulk (whatever it is comprised of) and the amount of fat. Body weight is of little comparative value without reference to height. The commonest method of referring to weight in relation to height is in terms of the table of ideal or standard weights for age and height. This is misleading, because the tables accept as normal an increasing weight with age. A better index of bulk is the ratio of weight over height squared, and a comparison of the two indices applied to measurements in Australia and New Guinea is extremely informative (Whyte *et alii*, 1958). As judged by the relative weight scale, Australian men were slightly overweight, but to the same extent at all ages, whereas the natives became progressively more underweight with advancing age. It might be mistakenly assumed from this that the degree of obesity of Australians remained constant, while that of the natives decreased with age. The reverse appears to be true from the weight over height squared indices; the bulk of the natives remained constant, while that of the Australians increased markedly. This refers to bulk. Obesity can faithfully be judged for comparative purposes, by using spring calipers (Figure IV) on the folds of skin and fat which can be pinched up at various sites of the body (Edwards and Whyte, 1959). Skinfold thicknesses show that Australians have a considerable amount of fat, and that variations in obesity contribute significantly to variations in bulk. The natives have very little fat, which varies but little with age or overall bulk. Thus, increasing bulk and obesity are features of our Australian manhood, but not of the natives. Neither bulk nor obesity showed any significant correlation with serum cholesterol level in either race.

Does the blood of the obese clot more readily than that of lean subjects? There seem to have been no studies on this question except our own, in which no correlation could be demonstrated in Australians between clotting times, both "Stypven" and whole-blood, and bodily bulk or obesity.

Blood pressure, however, certainly does enter into the obesity picture, and can contribute to any excess incidence of coronary disease associated with obesity. It is generally accepted, on the results available from many surveys, that a positive relationship exists between degree of obesity, or at least overweight, and level of blood pressure. However, there has always been some doubt because of the lack of any true measure of fatness, apart from bulk, and because of the possibility of falsely high readings of blood pressure being taken on fat arms. With the use of methods which avoid these difficulties, our own surveys have shown that the blood pressure of Australians is definitely related to body bulk, but not to obesity *per se*, except in so far as it contributes to overall bulk (Whyte, 1959). The greater the weight, the higher the blood pressure; but fatness does not affect the pressure unless it increases the body weight. The extent of this association is illustrated by the fact that an increase in weight from 10 stone to 15 stone would be expected to cause an increase in blood

pressure from 123/73 to 143/86 mm. of mercury. This is in Australians. Among the natives in New Guinea, no such correlation between bulk and blood pressure could be demonstrated. Nor was there any hypertension in New Guinea; the systolic pressure of males showed no trend with age, while the diastolic pressure actually fell, which is quite different from the experience in European communities (Whyte, 1958). It is tempting to suggest that overeating by Australians leads to increasing bulk and obesity with age and, perhaps linked with this, increasing blood pressure. The natives are free from this vice and these diseases.

FIGURE IV.
Calipers used for measuring skinfold thickness.

There are claims that there is an association between hypertension and the amount of salt ingested (Dahl and Love, 1957), and that the raised blood pressure found in obesity is due to a greater salt intake by those who overeat (Dahl *et alii*, 1958). Our results do not support this contention, as shown in Table II. Men having the same bodily bulk in Australia, on the coast of Papua and in the highlands of New Guinea differed widely in the amount of salt they habitually consumed, and yet their blood pressures were the same.

Sifting the evidence relating to the roles played by fatty foods and excess food in the production of coronary artery disease leaves the bare bones shown in Table III. Of course, they may be fictitious. But there are good reasons for believing that ischæmic heart disease and atheroma are more prevalent among fat-eaters and overeaters. The consumption of fatty food affects serum lipids and blood clotting, but not the blood pressure. Excess food, on the other hand, leads to obesity, which is unrelated to serum lipids and blood coagulability, but affects blood pressure. In the original scheme of Figure I, fatty food would work through the serum lipid-atheroma-clotting channel and obesity through the hypertensive vascular damage-atheroma channel. In both cases food has conceivably played a role in promoting disease of the coronary arteries.

## The Antidote to Food—Exercise.

One of the main purposes of eating is to provide the necessary energy for our daily activities, and the three main classes of foodstuffs contribute interchangeably through a common metabolic pool: food and activity—supply and demand. Physical activity counterbalances food; it also offers protection against coronary artery disease.

Ischæmic heart disease is less common among bus conductors than bus drivers, itinerant postmen than postal clerks (Morris *et alii*, 1953) and, throughout a whole range of occupations, in the more active than in the less active (Brown *et alii*, 1957; Morris and Crawford, 1958). Moreover, men whose work involves physical activity have less severe disease and develop it later in life. The mechanism whereby exercise exerts this beneficial influence on the coronary arteries is not yet clear—perhaps through causing collateral channels to develop—but it is of interest to examine the effects of exercise on the factors we have been discussing.

TABLE II.
*Average Blood Pressures in Men Aged 20 to 40 Years in Three Groups which Consume Different Amounts of Salt.*

| Subjects. | Blood Pressure. (Mm. of Mercury.) | Salt Intake. |
|---|---|---|
| Australian men (100) .. | 132/81 | +++ |
| Natives in New Guinea: | | |
| Coastal (79) .. .. | 131/78 | ++ |
| Highland (101) .. | 127/83 | +/− |

TABLE III.
*Factors Concerned with Coronary Artery Disease which are Possibly Influenced by Dietary Fat and Obesity.*

| — | Fatty Foods. | Excess Food. |
|---|---|---|
| Ischæmic heart disease | + | + |
| Atheroma .. .. | + | + |
| Serum lipids .. .. | + | − |
| Blood clotting .. .. | + | − |
| Blood pressure .. .. | − | + |

Men in heavy occupations have fewer blockages of coronary arteries, but no less atheroma (Morris and Crawford, 1958). Nor do they enjoy lower serum lipid levels (Keys *et alii*, 1956) or lower blood pressures (Newnham, 1952). But, physical activity can abolish obesity with its attendant troubles—raised blood pressure, atheroma and ischæmic heart lesions—and it offsets the effects of fat-feeding. An increased consumption of fat causes the serum cholesterol level to rise, but not if it is counterbalanced by exercise (Mann *et alii*, 1955). A fatty meal accelerates blood clotting; but this, too, is counteracted by exercise (McDonald and Fullerton, 1958). Furthermore, exercise promotes fibrinolysis (Biggs *et alii*, 1947).

It would seem that known or presumed ill-effects of fatty foods and of excess food can be effectively repressed by exercise. Instead of regarding coronary disease as a disease of dietary indiscretions and excesses, we might speculate with Morris and Crawford "that habitual physical activity is a general factor of cardiovascular health in middle-age, and that coronary heart disease is in some respects a deprivation syndrome, a deficiency disease".

## Conclusion.

The enormity of the problem of coronary artery disease in our community is matched by the immensity of published work relating to it, and by the depth of confusion and ignorance in which an understanding of it lies

at present. There is little doubt that the tremendous amount of work being done in this field will gradually clarify the situation, possibly to reveal that no one factor alone, but rather a number of constitutional and environmental factors, is involved. Perhaps food will figure among these; but, having spent all this time plucking out of the tangle threads of evidence which incriminate food, I hasten to add that many learned counsel concur in the opinion that in the light of present knowledge drastic changes in dietary habits are not warranted. There is no firm advice to fear fats and become food faddists. And I should hate to detract from the fourth need of food in man, as enumerated by Professor Eric Ashby in the fourth of these Cunning lectures—namely, æsthetic and social satisfaction.

Nevertheless, it is always interesting to observe the feeding habits of those engaged in this research, and their changing habits as their work proceeds. We are all members of an impressionable profession. It would be interesting to know what you advise your patients to eat or not to eat, and indeed, what you leave on your own plates—the doctors' dietary dilemma. If by this rather crude, unpolished lecture you have been persuaded that fats raise the serum cholesterol level, induce atheroma and blood clotting, and lead to ischæmic heart disease; that excess food produces obesity and through raised blood pressure, atheroma and more heart disease; that physical activity is an antidote to these poisonous effects; and that New Guinea natives are vigorously healthy individuals with sensible eating habits, while Australians are flabby, degenerate and diseased; then you must be reminded of St. Augustine's confession:

> Now therefore I had learned of thee, that nothing ought to be accounted true because it is eloquently delivered, nor accounted false because the words are rude; nor again true because it is spoken without polish, nor therefore false because it is clothed in courtly speech. But that wisdom and foolishness are like food that is wholesome and unwholesome, which may be served in plain or costly dishes, as the other in words that are choice or homely.

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# MEDICAL ASPECTS OF AN INDUSTRIAL MEDICAL PLAN.[1]

By J. L. STOKES, M.B., B.S. (Adelaide),
*Adelaide.*

MR. GIBBS has explained how the management of General Motors-Holden's Limited at Woodville set about establishing a medical plan in that plant. We do not claim that this is necessarily the ideal way to go about it. This is how it has evolved, and we have found it workable and useful. We are well aware that we have not yet developed it to the stage reached in other more advanced industrial countries.

When I first went to the plant, there was already established a satisfactorily functioning casualty set-up with most adequate facilities for the task presenting. Since then there has been considerable expansion of the work force, and hence additional work has had to be done as far as treatment of emergencies is concerned. We have gradually superimposed on that base the expanded activities resulting from having a qualified medical practitioner working within the plant full time.

The work load we have consistently found is that the attendance is fairly constant at about one visit per person on the payroll per month; this, as we are at present operating, means over 300 visits per day. Of these, some 10% require a qualified opinion in one way or another.

In our particular type of activity, the injuries occurring fall principally into the following major groups: (i) eye injuries from hot or flying particles, from chemicals and from welding; (ii) crush injuries from the handling of heavy objects and pinch points on machines, usually resulting in comparatively minor fractures of toes and fingers; (iii) lacerations, particularly of the hands and arms, from sharp panels of steel; (iv) strains and sprains from over-exertion, either from bad planning of the job, or, as is far more frequently the case, from thoughtless human bullocking, and failure to use the facilities readily available to do the job without back-breaking effort; (v) contact skin conditions from the handling of various irritant substances—oils, spirit, "Dueo" thinners and so forth.

## The Eye Hazard.

We found that up to 10% of the plant population would report in any year with an injury to the cornea—burn, fixed foreign body, chemical splash, abrasion and so forth. Such an injury is always referred to me; either it is readily treated at work with no loss of time, or of a portion only of the shift, or it is an ophthalmologist's problem. Before I arrived, the size of the problem had already made it necessary for an arrangement to be made by our insurers for immediate specialist attention. Although much of this treatment is now done in the plant when the patient is capable of remaining on restricted work, this arrangement remains, so that patients with more serious injuries are still referred immediately I consider it necessary.

As we progressed with our safety spectacle programme to the stage at which, because of the high hazard, the wearing of safety spectacles became mandatory in various areas, it became necessary to establish a scheme whereby prescription lenses made of hardened glass could be offered to employees at a subsidized rate. Although this full-time protection is really tried, there are still a very large number of corneal injuries. Many of the complaints against the wearing of safety spectacles, we find, are due to unknown refractive errors, so that the patient's reserves are further taxed by the wearing of the protective equipment. Making prescription safety spectacles available to these men has solved the bulk of these problems.

[1] Part of a symposium on industrial medicine, held at a meeting of the South Australian Branch of the British Medical Association on February 26, 1959.

## Crush Injuries.

Most crush injuries are minor fractures, and it was soon obvious that a readily available X-ray facility would prevent tremendous waste of time. Moreover, in most instances, if the patient knows why his finger or toe is sore and stays so, he puts up with the bother and prefers to work, provided his work is suitably arranged to avoid aggravation of the injury. Of course, I must ensure that its healing is not impaired by his activity, and that is not usually very difficult.

## Lacerations.

Many lacerations are minor, and after suture or a dressing only, the patients return to work. There are, however, a percentage of severe injuries involving tendon damage. Such injuries are a tragedy in a workman's life if there is any risk of permanent disability, and I think expert surgical treatment is a "must" if we are to keep the permanent damage from these disabilities to a minimum. Our experience is completely positive that such injuries should be repaired, if possible, by surgeons skilled in this particular field.

## Strains and Sprains.

Strains and sprains are a continuing problem. A few of the incidents reveal on the part of those responsible a lack of appreciation of the demands of the job in hand, and such tough physical jobs are continuously designed away by the provision of better facilities, better layout and better planning. In spite of this, human nature appears still to prefer to "heave" things about rather than to use the proper facilities if these are not immediately to hand.

It is hard, and often not good practice in my opinion, to let men with strained backs try to keep going on restricted work, and we usually send them off to recover. However, one has one's shocks—such as the man who claimed that he had suffered a hernia from lifting a part which, when weighed, was under one and a half pounds.

## Skin Disease.

Industrial skin disease from solvents, plastics, oils, kerosene, plating solutions and the many other irritants, is quite a large problem, and necessitates constant vigilance on the part of supervisors and the medical department staff, so that adequate action can be taken to investigate the circumstances, to establish proper protective measures or to change the materials used, or to reduce or to remove the hazard, in common with our general approach to accident prevention. Many of these patients continue at restricted work during their recovery; but our insurers, I think rightly, insist that if progress is not favourable, consultant treatment is probably necessary and should be quickly sought.

## Comment.

To sum up our evolved approach to treatment of work injuries: we will continue to treat the man when he is capable of continuing at his usual work or at restricted work, with his consent, and when we can accept responsibility for this management with our facilities and training. When we consider specialist management necessary, we arrange for it. When the injured man does not wish to use our services, or does not wish to perform restricted work during recovery—that is, he is unable to do his usual work—he is at liberty to consult whom he pleases, and any relevant information, such as X-ray films, immunization records and so forth, are sent on with him.

## Immunization Schemes.

We also have always offered all employees tetanus toxoid immunization, and have tried to encourage them to avail themselves of it. It was not until one of their workmates died of this awful disease that the men really took advantage of the offer; but now we have achieved, in some sections of the plant, an immunization rate of over 90%.

We hope soon, with the ready and efficient cooperation of the State poliomyelitis services, to offer active immunization injections to those qualifying for it.

### Hygiene Hazards.

We have not many highly toxic processes in the plant; but we do work with lead, and when I joined the company there was some management concern that the hygiene arrangements needed improvement. Various lead-in-air samplings had been made, and the next stage was the medical assessment of those exposed. This meant a review, with their consent, of some 400 men in one of the most physically strenuous shops in the plant. This start, because of its very honest preventive nature, helped to establish that a positive approach to the maintenance of health was one of the aims; and with fair handling of the physical problems revealed (which were few), a lot was done to destroy prejudice against the plan generally. From this initial survey, some stricter hygiene practices were established by the management, and since then a routine assessment of the exposure and of its effects has become an accepted part of the plant operation.

### Job Placement.

It soon became evident after I joined the company that one of the largest parts of the day would be devoted to the proper placement at work of men either permanently restricted in their capacity to work, or temporarily so because of illness or injury. This, of course, needs cooperation with the practitioner managing the case. Some of these cases are found in the odd way we all experience—such as when Jo Blow stops you in the corridor when you are late for a meeting, and asks about his retrosternal pain that occurs when he is half-way up the ramp at the railway station on the way home. Some of these conditions start as emergencies at work—for example, pneumonia, ruptured ulcer and so on. In these cases, when these patients are capable of returning to work and suitable work is available, we attempt to help them return to gainful employment as soon as their own medical adviser considers that they safely can return, and it is my job to advise their supervisors of their physical limitations so as to place them suitably. This is another reason why early steps were taken so that I might become familiar with the various operations in the plant, and know which ones could be carried out by which partially disabled people. Also, it takes constant inspection of the plant to keep up with the changing processes, machines and methods that are being introduced.

### Relationship with Other Practitioners.

Often in discussions on the subject of industrial medical services, there appears to be some fear or outcry that robbery is being done. Our workmen come from all over the metropolitan area—from as far as Gawler, Point Noarlunga, Clarendon and Uraidla. The vast majority of their injuries at work cannot surely justify a trip to their usual practitioner for their immediate treatment, even if it could be obtained as soon as the patient arrived there; and if he is dissatisfied with what our medical services advise him, we cannot and do not refuse him the right to consult his own practitioner. The same applies to his illnesses occurring at work. The patient is either fit enough to be at work, or he should rightly be under the care of his own practitioner, and is directed there with what help we may be able to offer. In the more serious injuries and illnesses, I decide to the best of my judgement what is the best emergency course, and when the man has a family practitioner I may discuss with him by telephone whether domestic treatment seems reasonable, or inform him of what I have found and done.

In very many cases, especially among migrants, the patients have no family doctor to whom they usually go, or if they have consulted someone they have not the faintest idea of his name and often cannot tell where his rooms are. We suspect that many migrants come to us for advice because they know that our plant interpreters are available to help them with their difficulties in explaining their problem in English. I therefore must "play the thing by ear" a bit, and I try to do so in the fairest ethical manner.

### Conclusion.

A lot of this talk has revolved about keeping people at work with their consent, although they have some degree of injury or need some rehabilitation. We are all aware of the better results of treatment when this can be achieved. I am apprehensive that someone is going to ask how one gets Australian workmen to agree to accept these ideas. Of course, one cannot always do so; but mostly one can, and very often they themselves ask if it can be done. We have been much too ready in the past to disparage our fellow and the products he turns out. I personally can never reconcile this disloyal idea with our other proud and proved concept that he is one of the best fighting men in the world. It does not make sense; he is the same man. My experience of the Australian workman is that he has the same mettle in peace as in war, and he will show us how if we put the challenge to him fairly.

## SOME GENERAL COMMENTS ON THE INTRODUCTION OF AN INDUSTRIAL MEDICAL PLAN.[1]

By A. G. GIBBS, B.E., M.I.E. (Australia),
*Personnel Manager, General Motors-Holden's Ltd., Adelaide*

THIS is to be a combined talk, in which I will refer to some management considerations, and then Dr. Stokes will follow to cover the medical aspects.

### Overseas Experience.

It should be appreciated that, before making any decision on a medical plan, we had available to us through our overseas operations considerable information regarding their experience in other overseas plants. In order to convey some idea of the extent of industrial medical services overseas, I would mention that in 1956 in North America there were 123 full-time medical officers in General Motors plants alone, whilst in England there were 186 full-time doctors in all industry.

We also had for some years in Australia, prior to making the appointment at Woodville, a full-time medical superintendent in our Melbourne plant, as well as a part-time doctor visiting the Woodville plant.

### Management's Attitude towards Industrial Medical Plans.

A *sine qua non* of any industrial medical plan is the right attitude on the part of management. One authority I heard speak on this subject in England said:

> The functions of welfare and safety form with that of medical, an indivisible Trinity within a broad conception of industrial health. The strength of the weld bonding this Trinity depends largely on Management's attitude towards the medical side of it.

It is not merely a question of providing the best amenities, the best safeguards and the best medical facilities, but, more important than this, of the degree of support and active stimulation received from top management. Management must have some views on this subject and state them to all levels of supervision.

### The Need for a Full-Time Medical Officer.

The expansion of our operations in South Australia to an employment level of 7000 and the introduction of new processes had brought many problems. To mention a few: (*a*) We had the largest plating department in Australia, incorporating cadmium, copper, nickel and chromium plating. (*b*) We had introduced many new solvents and adhesives in connexion with painting and trimming operations. (*c*) Our record of eye injuries and lacerations appeared very high. (*d*) We had a growing problem in the placement of old employees, as indicated

[1] Part of a symposium on industrial medicine, held at a meeting of the South Australian Branch of the British Medical Association on February 26, 1959.

by the fact that approximately 8%, or over 500, had worked with us for more than 25 years (some as long as 50 years).

### Decision with Appointment.

Before an appointment was made at Woodville, there was a top management discussion in Melbourne on how the plan would operate, the role of the medical officer, the basis for selection and the means to be adopted to ensure effective response to his opinions and directions. One of the first steps taken was to arrange for the doctor, immediately he was appointed, to spend some time making himself familiar with all operations in the plant, and this was done by freeing him from any normal duties until he had acquired this knowledge. The next step was to make him a member of the plant safety committee, which comprised all departmental heads as well as the plant manager, so that his views would be discussed with the people who had the responsibility for making decisions on running the plant. The next move was to supply him with relevant information on the operating of the plant, to enable him to operate as an executive and raise any aspects concerning his functions.

### Announcement of Appointment.

After the decision to appoint a full-time medical officer had been made, the following factory notice was issued in 1952 to describe his duties:

> Briefly the work of the Medical Superintendent can be summarized as follows:
>
> (*a*) The initial treatment of medical and surgical emergencies occurring in the plant.
>
> (*b*) To advise the Management on factory hygiene and any conditions affecting the health of employees, together with any other safety aspects.
>
> (*c*) Periodic examination of employees, with their consent, over a wide area of the Plant, to ensure no unforeseen health hazard exists.
>
> (*d*) Periodic examination of employees where the nature of the job on which they are at present engaged, makes it necessary for the safety of the employee concerned and others in the vicinity.
>
> (*e*) Advice to employees on health matters relating to their work.
>
> (*f*) Responsibility for efficiency of First Aid services in the Plant.
>
> The main query may arise in regard to employees seeking consultation with the doctor in regard to their general health, which is primarily the work of their private Medical Adviser. If an employee becomes ill whilst at work then the doctor will see him for the purpose of advising whether he should remain at work or not, and the necessity for consulting his own doctor. This may involve some initial treatment, confined to the one day only. On the other hand, if the illness is of industrial origin, then the Doctor would investigate the case to determine the course of future treatment.
>
> In cases involving Workmen's Compensation, the Doctor can only become involved in the initial treatment, as subsequent treatment is a matter to be handled outside the Plant.
>
> It is not intended, nor would it be possible, for the Doctor to function as a general Medical Practitioner to the personnel of the Plant.

### Industrial Aspects.

At this stage, in order to preserve the right sequence, Dr. Stokes should take over and describe how he started; but as we have divided the session between us, I want to move on to the industrial aspects before I conclude.

There were a number of industrial problems which arose after the appointment, and which I will briefly cover as a series of statements on what was decided.

1. The plant doctor was not to be involved in arguments or discussions on workmen's compensation cases. This was a matter between the insurance company and outside medical practitioners.

2. As the unions raised some queries on medical examinations, it was necessary to define our policy on this subject. The policy is given in some detail, as it covers a number of important aspects which formed the basis of our reply to the union.

(*a*) Medical examinations. Medical examinations are to be entirely voluntary except: (i) when required by law; (ii) when it is considered that, by the very nature of the job, physical fitness is essential to ensure the safety of others; (iii) when, in certain areas, there is a definite hazard such as toxic solvents. (Jobs in categories (ii) and (iii) would be kept to a minimum and declared before compulsory medical examinations would be instituted.) Industrial issues involved when employees had been found unfit as a result of medical examinations under (i), (ii) or (iii) would be dealt with according to the principles set out below:

(*b*) Transfers. In effecting transfers, employees will be placed in work entirely within their capabilities, so that they may operate as efficiently as others around them. This will obviate any feeling of prejudice or inferiority.

(*c*) Pay. As far as possible, employees will be placed so as to avoid a decrease in wages. The company, however, can give no guarantee that there will be no variation in marginal rates.

(*d*) Refusal to transfer. Each case will be treated on the merits, and the decision will depend on whether it is the safety and welfare of the individual alone that are likely to be affected, or whether other employees are involved.

(*e*) Retrenchment. Company policy does not make any special provision involving personnel transferred on medical grounds. As provided in (*a*) and (*b*), individuals will be carefully placed and will be considered as on a similar basis with all other employees should retrenchment measures be introduced.

(*f*) Results of medical examinations. The medical or physical condition of an employee revealed at an examination is a confidential matter between the company doctor and the individual, and no divulgence of such condition will be made unless the consent of the individual concerned has been given, or unless the company is required by law or regulation so to do.

(*g*) Reference to outside medical opinion. The company doctor will, if necessary, consult with the physician or specialist selected when an individual decides to seek an outside medical opinion.

3. The unions realized that the success of the plan would depend largely on individual experience and acceptance; in other words, we were both prepared for a slow acceptance of the plan, and our experience during the past seven years supports this approach.

4. Individual experience of being maintained in continuous employment on restricted work versus a drop in earnings whilst absent on compensation would be a big factor in this acceptance problem.

5. The realization that supervisors were being told (and that they accepted) specific directions from the doctor relating to the employee's work (without relying on "light" duties) was an important item.

6. Free discussion between the personnel staff and the unions (the doctor being kept out of industrial issues) on any problem related to the plan ensured an open approach to the subject.

### Analogy with Fire Programme.

In a preliminary discussion with your President on the subject of tonight's meeting, he asked whether I was going to produce any statistics to show the position before and after the introduction of a medical officer into the plant, and whether I would deal with some of the things that have changed. I did not give him a direct answer, as I told him statistics might be misleading, and suggested that I might be allowed to give the answer in my own language. He gave me a free hand in this regard.

In order to deal with the question of changes that resulted from the doctor's appointment, I want to tell the story of our experiences with the appointment of a full-time fire marshal. (I hope no one here tonight is going to be sensitive enough to think I am comparing a doctor with a fire marshal, although, from my reading of a little of the history of Greek medicine, it seemed to me that it was a bit of a toss-up in those days whether they went the way of Hippocrates, or the way of fire worship.) To return to my fire marshal man, we had the following experiences immediately after he was appointed: (i) More fires than ever before were being reported. (ii) The fire brigade was in and out of the plant far more often (accompanied by the usual blaring of sirens). (iii) Our costs for new extinguishers and preventive equipment increased tremendously. (iv) The fire marshal became a first-class nuisance by banning the use of certain volatile toxic solvents and worrying the production people about safety precautions. (v) There were industrial problems with the unions, when employees who had smoked peacefully in the factory for 25 years found that there were certain prohibitions (which had nothing to do with lung cancer), and that they had to change some of their old habits. (vi) The fire marshal worried supervisors stiff by issuing dire warnings on what could happen in their departments if there was any laxity in regard to fire prevention. In short, we had hired a first-class ulcer producer; but we did not sack him.

I think it would still be more ethical to continue using the fire marshal analogy and tell you of some of our other experiences and how we approached certain problems. (I would repeat that if there is any inference or parallel that can be drawn from my remarks and applied to the medical side of the story, then it is purely coincidental and I hope I offend no one.)

We have, as part of a fire plan, something like 150 men who are trained as first-aiders in the use of what we call "our first-aid fire equipment"—that is, hand extinguishers, etc. These men are trained and sit for an examination conducted by South Australian Fire Brigade officers. The question may arise whether the professional firemen are likely to take a poor view of this; but I can assure you that they are always summoned where there is the slightest risk, and on most occasions arrive to find that the fire is out, which they like to see. Their outlook on this subject is a very broad one, and they realize the need for trained people to assist, particularly during times when there is a heavy demand for their services. We have had the senior officers from the Fire Brigade in our plants several times a year to discuss mutual problems, and they have been very helpful in suggesting improvements.

One of the essentials with all fires is to have a full inquiry into the causes, and we devote a lot of time to this, because a searching analysis has led us to many of the changes that we have made. We apply the same thinking to accidents.

To deal with the preventive side of fire protection: this is a big job if it is to be done properly, and we have spent a lot of time and money on it. We have been influenced to a considerable extent by the experience in our overseas plants and by material they have supplied to us, particularly after the large fire at Livonia, U.S.A., in 1953.

Someone may ask why we cannot rely on government regulations, etc., to provide the necessary controls and codes for safe operating in this field. I can assure you that we could be burnt down tomorrow if we took that attitude, as such provisions are not intended to cover the work of management in creating an awareness of fire risks and initiating controls or measures to prevent fires.

It is interesting to note that, in the tackling of our problem, every square foot of the 43·5 acres of plant under roof at Woodville is protected by a temperature rise indicator of some sort, which is registered in a control room to give an indication of possible fire. (I had to bring in a parallel somewhere with the medical side, and I thought the excessive temperature rise might provide it.) Someone will ask what a small factory can do about such things. Firstly, I know that the Fire Brigade have never yet refused to send one of their officers to a factory to give an opinion on the fire aspect. When it comes to spending more time on detailed matters as well as training, etc., which it is not possible to do without taking officers away from their normal fire duties, we make special arrangements to get the service.

Another valuable aid is the use of the fire underwriters' services. We have had them in our plant making surveys from time to time, looking at things with the eye of an outside specialist. They go into considerable detail with regard to the inspection of electrical and sprinkler installations.

### Conclusion.

I have said a lot about fire, because it is an important part of the safety function, which is in turn part of the indivisible trinity with welfare and medical aspects. I do not want to leave you in any doubt as a result of my earlier references; ever since we had a full-time doctor, we seem to have had more ambulances coming into the factory, more records of people getting lint, etc. However, it all depends on how you look at all these things, not knowing what was hidden before.

In conclusion, I do not think that anybody can have a good safety plan and neglect medical plans. It is my experience that a lot of factories need to improve both, and I cannot see how you can have one without the other. Finally, I should like to express my appreciation for the opportunity to talk on my side of the problem, and assure you that I have enjoyed being associated with an industrial medical plan.

## DOCTORS AND THE PREVENTION OF HIGHWAY ACCIDENTS.[1]

By D. C. HOWLE,
*Tamworth, N.S.W.*

ROAD ACCIDENTS are our Number One health problem. In a recent issue of the *Journal of the American Medical Association* devoted to a symposium on road accidents, the leading article stated: "We are confronted with a massacre without precedent, without good reason and without a ready solution. The control methods are inadequate." The same can be said of road accidents in Australia.

The following statistics were issued by the Department of Road Transport, N.S.W., in October, 1958. The number of accidents reported in the year under review was 44,164—an increase of 11·2% over 1957; the number of persons killed was 795—a 2·7% increase; and the number of persons injured was 19,378—an 11·9% increase. In the same period the number of motor vehicles registered increased by 6·8%.

### Car Design in Relation to Accidents.

The American Medical Association, in conjunction with the American Automobile Association, after a great deal of consideration and the carrying out of many experiments, designed a hypothetical car in 1948. This car design showed many changes on current practice, but only a few of these modifications were incorporated in car design, even in 1958.

The recommendations were as follows: (i) narrow windscreen pillars, promoting better visibility; (ii) safety-type steering wheel, which would minimize chest injuries to the driver; (iii) elimination of projecting fittings inside the car; (iv) padded instrument panel; (v) recessed rear-view mirror; (vi) doors hinged at leading edges; (vii) door locks which would keep doors closed, despite twisting of body work; (viii) bumper bar mounted on shock absorbers in order to absorb some of the impact; (ix)

[1] An address delivered at the annual meeting of the Northern District Medical Association at Armidale on November 30, 1958.

reinforcement of the roof in case of a roll-over; (x) windscreens which are shatter-proof and which pop out in a crash instead of disintegrating all over the passengers; (xi) above all, adequate safety straps.

It needs to be realized that if a vehicle travelling at 30 miles per hour hits a stationary object, its speed of 30 miles per hour is reduced to zero in two feet. This has been proved by experiment. The force which is exerted on the front of the car is equivalent to 15 G. This force is, of course, applied to the passengers as they are also travelling at 30 miles per hour, and they also pull up in two feet, when they strike some portion of the interior of the car. It will be appreciated, therefore, that they are hurled about inside the car with terrific violence, thereby receiving severe and often fatal injuries.

Safety straps, if securely fastened to the chassis of the car, or equivalent portion of the structure of the car, beneath the seat and adequately fastened to the passengers, preferably round the shoulders, will prevent the passengers being hurled about inside the car.

In many accidents the passenger is hurled to his death out of the car, owing to the doors springing open; it will be seen here too that the safety strap will prevent this type of injury or death. In roll-over accidents the doors fly open in 77% of cases, whereas in non-roll-over accidents they open in 53% of cases.

In order to have carried out all or in fact many of the modifications in the hypothetical car just listed, it would involve many years' work by the car designers and the overcoming of much sales resistance by the car-buying public. On the other hand, the fitting of safety belts is relatively inexpensive, and these could be fitted to any existing motor vehicle.

In a leading article in the MEDICAL JOURNAL OF AUSTRALIA dated July 12, 1958, it is reported that further work concerning safety belts has been undertaken in Sweden, and one large government body has adopted safety belts as standard equipment in all vehicles; the Swedish motor-car manufacturers have adopted the belt as standard equipment. They have felt that to popularize the idea of safety belts, the belt must be designed as simply as possible, and it consists of a chest strap fitted with an emergency clasp. When the experiment started in 1955, it was found that only the vaguest ideas existed both in Sweden and abroad concerning the stresses for which the belt should be designed. It appears that the material considered to be the best is a webbing of nylon and soft steel. The attachment points of the belt to the car have been chosen to provide the largest possible measure of protection against head and chest injuries, which are typical of automobile accidents. It is arranged with a quick release clasp, which also acts as an adjustable buckle, in order to accommodate various sized passengers.

### Vehicle Maintenance.

Faulty conditions of the vehicles themselves have been found to cause 8·3% of accidents. Thus there should be more rigid inspection of brakes, lights, exhaust systems, shock absorbers, tyres, suspension system, steering, and even the seating of the driver.

## Some Ways in which the Medical Profession may Assist in this Problem.

### *Medical Examination.*

A qualifying medical examination should be mandatory prior to the first issuing of a driver's licence.

Some industrial firms have insisted on a medical assessment of fitness before employment, and this has reduced their accident rate by as much as 50%.

The medical assessment should be based on the following criteria: (*a*) Is the driver physically and mentally able to manipulate the controls and maintain such work for long periods? (*b*) Has the applicant a safe standard of vision and hearing? (c) Is there any risk of sudden loss of consciousness while driving? (*d*) Is there any likelihood of severe fatigue towards the end of the day with consequent increased danger of accident?

In this medical examination, before a driver's licence is issued, special attention should be paid to the following: (i) eyesight—visual acuity and depth perception; (ii) accident-proneness; (iii) impairment of hearing and disturbances of equilibrium which can upset the normal performance of the driver; (iv) a history of vertigo or Ménière's disease; (v) the epileptic; he presents a great problem.

### *Psychological and Psychiatric Aspects.*

Ross A. McFarland, Associate Professor of Harvard School of Public Health, stated in his paper read at an American Medical Association meeting in June, 1956:

> Though no single characteristic of drivers has yet been isolated that appears to be outstanding in accounting for the large proportion of accidents on the highways, there do appear to be several etiological groupings.
>
> One of these is the accident repeater, who may manifest general instability in society or even possess a mild psychopathic personality. As in the control of other epidemics, we must find means of identifying the most important variables relating to the host, as well as the agent and the environment. Physicians can play an important role in such an approach.

Brandoleone, a medical director of a large American transport company, stated that since the introduction of psychological tests in a medical programme for their metropolitan drivers, the rate of accidents has been reduced from 6377 in 1946 to 3130 in 1955. He stated, too, that the cost of maintainng this medical department per year is less than the cost of one bad accident.

S. E. Miller, one of a consultant group at the World Health Organization meeting at Geneva in 1956, stated that the place to apply prevention concerning automobile accidents is at the point where individuals receive licences permitting them to drive. A medical condition, either physical or mental, that can cause a driver to be a poor risk, should be detected by adequate screening and testing. He said that in this way we may solve the basic problem of sorting out those individuals who will constitute a hazard to themselves and to others while on the highways. He went on to say that the public should be conditioned to accept more stringent qualifications for driving motor vehicles, such as those now accepted for flying an aeroplane.

It has been truly said that more continuous attention from moment to moment is required of the motor vehicle driver than of the operators in any other type of transportation, including the aeroplane.

### Conclusions.

You, as doctors, have the following functions to perform in order to assist in the prevention of motor accidents.

1. To establish medical standards necessary for obtaining a driver's licence.

2. To determine the type and frequency of periodic re-examinations.

3. To engage in research concerning the relationship of specific organic and psychological states to motor vehicle accidents.

When it is realized that one car in twelve is involved in a serious crash each year, that speed is a factor in one-third of all our fatal accidents, that the drinking driver is involved in approximately one-quarter of all our fatal accidents, that the automobile death rate, as figured in man years of life lost, ranks next to our main killers—cardio-vascular disease and cancer—it is indeed time to answer Cain's query and say: "Yes, I am my brother's keeper."

To fulfil this promise we must first overcome by education the apathy of the public, the apathy of our legislators, and the apathy of traffic judges. Secondly, adequate and stricter laws must be enacted—laws far more severe than any we now use. The speeding and the drunken driver can then be curbed by their prompt and impartial

administration. Thirdly, safer cars must be provided to protect us in crashes which seem inevitable. Fourthly, better and safer roads must be built; 7% of acccidents are due to road faults.

A National Automobile Safety Foundation should be set up to study all phases of car crashes. The foundation would, of course, incorporate the medical and surgical research sides. This foundation could be financed by funds from insurance companies, from the automobile industry and its many allied companies and from certain government departments.

Crash injuries could then be studied from all angles, such as education, motor and highway engineering, law enforcement, legal and judicial points of view and medical and surgical aspects. Necessary research could be directed and financed, and duplication of effort could be avoided.

I quote portion of a leading article from THE MEDICAL JOURNAL OF AUSTRALIA of June 29, 1957:

> F. H. Mayfield puts the position concisely and vividly: "As each additional motor vehicle leaves the assembly line, the space on the highway between it and other cars is narrowed, and it seems inevitable that crashes will occur." Both in the prevention of such crashes and in the prevention of injury when crashes do occur, as well as in the efficient immediate and subsequent care of those who are injured, the medical profession can and should have a great deal to say.

## THE MANAGEMENT OF THE ASTHMATIC CHILD.[1]

By HELEN WALSH,
*Sydney.*

EVERY asthmatic child is a challenge to his doctor, whether general practitioner or pædiatrician. The acute attack is alarming and distressing, but its treatment is usually not difficult and is often gratifying to the doctor as well as to the patient. However, prevention of further attacks is a different matter; but prevention must be attempted if the child's mental and physical progress is not to be hampered. The difficulties are great, largely because the disease has no single and defined ætiology.

The fundamental lesion in asthma is a physical one—an antigen-antibody reaction on cellular surfaces resulting in release of histamine—but the antigens are legion in number and variety. Psychosomatic factors, often as difficult to define as the offending allergens, can unquestionably provoke or accentuate an attack. The asthmatic child can be managed successfully only if the physician does not waver in his attempts to define the nature of the ætiological and provoking agents.

In the discussion which follows, management is based on the pathogenesis of the disease. However, a brief account is first given of the incidence, clinical features and pathology.

### Incidence.

There are few accurate records of the incidence of asthma. Williams (1957) stated that bronchial asthma is the commonest problem confronting the children's specialist today, and that it ranks high amongst the chronic complaints of children treated by the general practitioner. As a point of interest, the incidence of asthma in a small group of families attending a suburban practitioner was estimated. The practice was confined to children, and only those between the ages of one and thirteen years were included. Approximately 10% of the total number of children experienced recurrent attacks of asthma, and 20% of the families included at least one child with this condition. These figures probably overestimate the incidence of asthma in the child population, but it is clear that the condition is common.

[1] The New South Wales Branch (British Medical Association) Prize Essay, 1958.

### Clinical Features.

The method of presentation of an asthmatic child is extremely varied, though the clinical features at the time of an attack are variable only in intensity. He may be brought to the doctor with a complaint of cough or nocturnal wheezing which annoys his parents and disturbs their sleep. He may be a small child who is recovering from infantile eczema, but now for the first time has alarming breathlessness, fever and cough. If he is a little older, he may present as a malnourished, sickly child with an already deformed chest wall, poor muscle tone and commencing emphysema, these being the signposts of chronic asthma. By contrast he may be an intelligent, alert, likeable fellow, who is usually thin and sallow but reasonably well nourished. He is nearly always over-active, sensitive and anxious to please, though not confident of his ability to do so. At varying intervals this same child succumbs to an attack of asthma in response to some particular stress or "trigger". The attack may last hours or days, and is usually followed by an annoying cough and slight breathlessness for a variable period. When infection is present, there may be signs of accompanying bronchitis. Nasal symptoms frequently precede the onset of attacks, and it may be difficult to decide whether this type of rhinitis is due to infection or allergy or both. If he is unlucky, he may have long periods of severe and violent expiratory wheezing—status asthmaticus. Fatalities due to asthma rarely occur in childhood, and are due to sudden cardiac arrest following prolonged or acute anoxæmia or unwise therapy. Diagnosis is seldom difficult except in early childhood, when the expiratory wheeze is not so obvious as in older children. A history of repeated attacks of dyspnœa associated with a finding of sonorous or sibilant rhonchi is very suggestive. "Allergic bronchitis" is a useful term at this stage. Other allergic manifestations, such as urticaria, colic and diarrhœa due to food allergies and infantile eczema, often precede the development of asthma.

Attacks of asthma vary in frequency and severity. The effect on an individual child's physique and life in general may be almost negligible, or so profound as to cause chronic invalidism and occasionally a fatal issue.

### Diagnosis.

The diagnosis of asthma is usually based on history and observation during an attack. A detailed history is important if the various ætiological factors are to be assessed. A general physical examination should be made, with special attention to the nutritional state and the condition of the heart, lungs and upper respiratory passages. An X-ray examination of the chest and a Mantoux test should be performed on all patients.

The diagnosis of asthma is usually easy, but occasionally it may be confused with other causes of wheezing, such as cardiac failure, congenital stridor, inhalation of a foreign body, infective bronchitis, pneumonia, atelectasis or the presence of tuberculous glands.

### Histopathology.

The pathological basis of asthma, as of allergic rhinitis and angioneurotic œdema, is local vasodilatation, increased capillary permeability and tissue œdema. The bronchi and bronchioles contain tough mucinous exudate, while the bronchial mucosa becomes œdematous with cellular infiltration of the submucous layers. Eosinophils are a feature of this infiltration. Partial obstruction of the smaller bronchi and bronchioles may cause areas of distension of the distal segments of the lung with the development of emphysema. Complete obstruction, particularly if infection is superadded, results in collapse of the lung segment with possible segmental pneumonia. There is no evidence of hypertrophy of the bronchial muscle. Williams (1957) published an account of his autopsy findings in children who had died from bronchitis, asthma and emphysema. He stated that from the histologist's viewpoint asthma is basically catarrhal bronchitis and bronchiolitis, and he

was unable to find histological evidence of muscular spasm.

### Pathogenesis.

It is generally believed that asthma follows the release of histamine and possibly similar substances in the bronchial walls. This is nearly always the result of a local antigen-antibody reaction, but it may be directly caused by certain irritants. The responsible antigens are usually proteins, and the subject develops specific antibodies after repeated exposures. Most people come into contact with the antigens, but only certain subjects produce clinical manifestations. These people are said to be allergic, and asthma, like hay-fever and angioneurotic œdema, is regarded as an abnormal or hypersensitive "allergic" response to the antigen-antibody union. Heredity probably plays an important part in determining whether or not a person will produce allergic reactions, and also the type of clinical manifestation.

Schild, Hawkins, Mongar and Herxheimer (1951) investigated the reaction of isolated human asthmatic lung and bronchial tissue to specific antigens. When the tissues were exposed to dilute solutions of the antigens to which the patient was sensitive, histamine was released and the bronchial muscles contracted. Similar tissues from non-asthmatic patients did not respond in this way to the allergens used.

Histamine produces vasodilatation, increased capillary permeability and tissue œdema, which are the pathological lesions of all allergic reactions. During an attack of asthma there is œdema of the bronchial endothelium with increased secretions, followed by spasm of the smooth muscles of the terminal bronchioles. Normally the lumen of the bronchioles is widened during inspiration and narrowed during expiration. Expiration becomes ineffective if spasm and œdema are added. If infection occurs, the secretions thicken and small bronchi may become plugged, with the production of areas of collapse, emphysema and pneumonitis.

The various clinical features exhibited by a child during an asthmatic attack can be related to the sequence of events which has been described. Classically, there is expiratory difficulty with high-pitched dry rhonchi, but the presence of bronchitis may modify these signs. In more severe instances the child is anxious, slightly cyanosed and sweating, while he struggles to expel air out of his lungs. The chest is hyperresonant, with diminished air entry. If asthma occurs frequently or for long periods, there is less recovery during the intervening periods. The chest wall becomes rigid and deformed, with increasing evidence of emphysema. These changes are at first reversible, but later become permanent, and breathlessness, poor nutrition and slow growth follow.

Skin-sensitizing antibodies are found in asthmatic subjects. In serum sickness, antibodies capable of precipitating the antigen *in vitro* can be demonstrated in the serum of sensitized individuals, but in asthma the serum usually contains skin-sensitizing antibodies which are not demonstrable *in vitro*. Intracutaneous injection or scratch testing with a given antigen will demonstrate the presence of skin-sensitizing antibody by producing an area of vasodilatation and increased capillary permeability. An itchy erythematous weal is formed, and occasionally asthma or a constitutional reaction follows. If a small amount of serum from a skin-sensitive person is injected intracutaneously into a normal person, his skin at the site of injection will react specifically to scratch and intracutaneous tests. There has thus been passive transfer of the skin-sensitizing antibody—the Prausnitz-Kustner phenomenon.

In this discussion of the pathogenesis of asthma, emphasis has been placed on the role of the antigen-antibody reaction in genetically predisposed individuals. However, many authorities believe that a certain type of temperament, which may also be inherited, is peculiar to sufferers from asthma. Nervous factors certainly appear to play an important part in the ætiology of asthma, but it is difficult to decide in individual cases whether they are the cause or the result of asthmatic attacks. Numerous "triggers" or exciting factors may provoke asthma, as shown in Table I. Their relative importance in an individual case is difficult to assess, and various antigens and exciting agents can probably act synergistically.

### The Problem of Management.

Asthma is a common condition, and it therefore tends to become uninteresting to the patient's family and to his doctor. It can often be diagnosed by the parents or neighbours; but its pathogenesis is not clear and the precipitating causes are many and variable. Treatment is often empirical and based on theories and impressions. Most parents are aware that there is no cure, but this does not deter them from continuing the search and hoping that something will be achieved. In such an atmosphere, relapses are disappointing and medical advisers may become apathetic and uninterested. Another "asthmatic" is seldom a welcome addition to a general practice or out-patient department. Patients tend to migrate from one doctor to another, from chiropractor to physiotherapist, from herbalist to hypnotist, and then to do the rounds again. It has been said that any treatment will result in temporary improvement, and this seems to be so. This makes evaluation of any therapeutic programme difficult, whether it is in an individual or in a group. In the light of our present knowledge, it would seem necessary to alter the genetic constitution of large numbers of the population if asthma is to be prevented. This is hardly feasible at present.

TABLE I.

*Factors which May Provoke Different Allergic Reactions during Childhood in Genetically Predisposed Subjects.*

| *Age Group.* (Years.) | *Common Provoking* Factors. | Clinical Manifestations. |
|---|---|---|
| 0 to 2 | Foods.<br>Infection.<br>Drugs. | Eczema.<br>Gastro-intestinal symptoms.<br>Urticaria.<br>"Allergic bronchitis."<br>Asthma. |
| 3 to 5 | Infection.<br>Foods.<br>Emotional factors.<br>Inhalants.<br>Drugs. | Asthma.<br>Allergic rhinitis.<br>Urticaria.<br>Occasionally eczema. |
| 6 to 13 | Emotional factors.<br>Infection.<br>Inhalants.<br>Climate and other environmental changes.<br>Over-exertion.<br>Digestive upsets.<br>Drugs. | Asthma.<br>Hay-fever.<br>Allergic rhinitis. |

The principles of practical management will be discussed under the following six main headings: (i) avoidance of contact with known antigens and exciting agents; (ii) chemical counteraction of histamine effect; (iii) prevention of formation of histamine by immunization procedures; (iv) use of anti-histamine drugs; (v) prevention of injurious effects of antigen-antibody union by steroid therapy; (vi) general measures designed to reduce hypersensitivity.

#### *Avoidance of Contact with Allergens and Other Exciting Agents.*

This includes the whole procedure of establishing the most important excitants in the case of each child. Unfortunately allergens tend to be multiple and synergistic, and sensitivities vary at different times. A detailed history is of inestimable value, and sometimes may assist more in a child's management than a barrage of tests.

As has already been mentioned, skin tests are based on the fact that substances producing allergic reactions may also produce skin-sensitizing antibodies. Patch,

intradermal or the more popular scratch tests can be used. Fresh, potent antigentic material is necessary for satisfactory results, and no anti-allergic drug should be given for some hours prior to testing. The technique is easy, but the interpretation of results is often difficult. Some mildly affected children may react to many substances, while the skin of young children usually reacts poorly. Some allergists, including Unger, Wolf, Johnson and Unger (1958), believe that skin tests are of vital importance in the management of asthmatic children. Hamilton (1958) states that they are not often helpful, should not be used for "needle-shy" children, and can provide useful confirmatory evidence only if the history suggests sensitivity to some antigen. It is not unusual to obtain positive results to skin tests with substances which seem to be unrelated to the production of an attack of asthma.

Allergens and other exciting agents fall into the following groups:

*Foods.*—Young children are sometimes sensitive to certain foods. Urticaria, gastric and intestinal disturbances, eczema and, less commonly, asthma may result. Vague digestive symptoms in older children often precede an attack of asthma. A careful history, the keeping of a dietary diary by the mother, and occasionally the use of "elimination diets" may help to define harmful foods. Skin tests are seldom useful in elucidating food allergies.

Care must be taken that the nutrition of the child does not suffer during the investigations. Food allergies tend to be variable, and after a period of withdrawal, foods to which the patient was previously sensitive can often be taken again without producing symptoms. Milk, eggs, tomatoes, oats, oranges, bananas, fish, vitamin B preparations, honey and chocolate are frequent offenders. Goat's milk seems less "allergenic" than cow's milk, and evaporated milk seems better than fresh milk. Cooking sometimes alters the antigenicity of foods.

*Infections.*—Infections are probably the most important provoking agents of asthma in the young child. The infection may itself "trigger" an attack, or the subject may be hypersensitive to the causative bacteria or viruses. In the early stages it is difficult to distinguish a true infection, such as coryza or bronchitis, from the purely allergic reactions of allergic rhinitis or asthma. Continuous chemoprophylaxis may be helpful, at least during the winter months, if coryza frequently precedes asthma or if bronchitis is often associated. Drugs such as sulphadimidine or phenoxymethyl penicillin (penicillin V) may be used. A suggested dose of sulphadimidine is 0·5 gramme twice a day for children more than seven years old, and 0·3 gramme twice a day under this age, while penicillin V can be given orally in doses of 200,000 units twice daily irrespective of age. An alternative prophylactic scheme is to give either of these drugs at the first sign of infection, and to continue their use for one week.

Obvious chronic or recurrent infection, particularly of the upper respiratory passages, requires treatment. Infected antra and large nasal polypi are frequently found in older asthmatic children and should receive attention. However, the occurrence of asthma is not an indication for tonsillectomy. Avoidance and treatment of infection have been regarded as particularly important by Chobot (1952) and by Whiteman (1951).

Specific skin-sensitizing antibodies against bacterial vaccines and filtrates have not been demonstrated, and skin tests with these materials are of no value.

*Drugs.*—Aspirin and vitamin preparations are the commonest allergens in this group, and can be easily avoided.

*Inhalants.*—These are often important in older children. Seasonal asthma, particularly when associated with rhinitis and hay-fever, suggests certain pollens or grasses as the sensitizing agents. Skin tests may be helpful in determining the allergens involved, and measures can then be taken to reduce the risk of contact. House dust, animal fur, feathers, fungi and all kinds of fluff and fine particulate matter are commonly incriminated. In general, the asthma sufferer should avoid dusty places and districts. His house should be kept reasonably free from dust and pollen-bearing flowers, and his own mattress and pillows and those of his family should be made of rubber or be covered with plastic material. His pets should be kept out of the house and banned completely if asthma is severe.

*Nervous Factors.*—It is often difficult to assess whether nervous factors act as exciting agents or provide a background for the action of allergens. Obviously emotional upsets and severe nervous strain are best avoided; but emphasis must also be laid on measures aimed at improving the child's emotional reactions to the inevitable stresses and strains of life.

*Other Excitants.*—These are sometimes obvious to the intelligent family, and it may be possible to avoid them. Such factors as over-exertion and digestive upsets are often preventible. Sudden temperature changes and the high humidity of coastal New South Wales are beyond the control of even the most intelligent asthmatic child; but he can learn not to compete in all the races on sports day, and to take an extra garment to avoid chilling after swimming. These simple measures and many others may often reduce the number of attacks, but will not earn him the name of "sugar-baby".

*Comment.*—As has already been mentioned, a single allergen or several separate substances exerting a cumulative or synergistic action may produce clinical asthma. It is possible that the success of some radical change in a child's life is due to his removal from a number of exciting factors. A long holiday with a change of environment or a period at boarding school is often beneficial. Recently Solomons (1958) described the results obtained at the Asthma Clinic of the New South Wales School Medical Service. At the commencement of treatment, children attending the clinic spent some weeks in bed, and they were then allowed increasing activity until they returned to school after approximately 12 months. These children were thus protected from a multiplicity of allergens and from infections and nervous disturbances. Approximately 75% of the children treated at the clinic for periods varying from three months to five years showed considerable improvement.

### Chemical Counteraction of Histamine Effect.

Certain sympathomimetic drugs are useful by virtue of their antispasmodic action. No more potent bronchodilating agent than adrenaline (epinephrine) is available to the physician. This drug also lessens œdema of the bronchial mucosa, and may thereby increase the vital capacity of the lung. A watery solution of adrenaline given by hypodermic injection produces an almost immediate effect. A suspension of adrenaline in oil is also available and has a more prolonged action. Inhalant solutions are prepared for use in nebulizers. Patients with asthma tend to develop tolerance to this drug, and for a time may become "adrenaline-fast", so that increasing doses produce little or no relief and the usual side-effects are exaggerated. This resistance is common in status asthmaticus.

Ephedrine is another useful drug in this group, and for mild attacks can be given by mouth at intervals of four or six hours.

Isoprenaline sulphate ("Neo-epinine") and isoprenaline hydrochloride ("Isuprel") are potent bronchodilators, but have less effect on the blood vessels than ephedrine or adrenaline. They may produce palpitations or vomiting in some children, but can be given as tablets for sublingual use or as pharyngeal sprays.

Aminophylline (theophylline with ethylene diamine) belongs to the xanthine group of drugs and is a powerful bronchial muscle relaxant. It can be given by mouth, intravenously or as a suppository. Some children are sensitive to aminophylline, and experience severe abdominal pain and vomiting when it is given (Nolke, 1956).

Many useful proprietary preparations combine several antispasmodics, and some have phenobarbitone in addition. An adequate intake of fluids and expectorant mixtures containing iodides or ipecacuanha may assist the action of antispasmodics, particularly if cough with sticky secretions is troublesome.

*Prevention of Histamine Liberation by Immunization Procedures.*

The mechanism of hyposensitization (desensitization) is not clearly understood, but the aim is to reduce the reaction of an individual to an allergen. The antigen is injected (or, rarely, ingested) in increasing amounts at regular intervals for a long period. During hyposensitization, the skin-sensitizing antibody in the serum increases in concentration, as can be demonstrated by passive transfer to the skin of a normal person; but prolonged treatment causes a gradual decrease to below the original level. Hyposensitization also produces a "blocking antibody" in the serum of the treated subject. This "blocking antibody" is distinct from the skin-sensitizing antibody, and the work of Loveless (1943) suggests that it is mainly responsible for the reduction of the patient's sensitivity. Unlike the skin-sensitizing antibody, the "blocking antibody" is thermostable. It appears to combine with the antigen, thus preventing union of the antigen with the skin-sensitizing and other fixed tissue antibodies. Histamine release and clinical manifestations therefore do not occur. Protection against asthmatic attacks is only partial, and excessive exposure may still produce symptoms.

In children, hyposensitization should be attempted only if other measures have not proved successful, and if skin tests have disclosed definite sensitivity to allergens which cannot be avoided. Commercial preparations containing extracts of pollens, grasses and house dust are available and may produce effective hyposensitization if used for a long period. Frequent "booster" courses are usually required. Many physicians advocate injections of mixed bacterial vaccines if the child suffers frequently from infections. Frankland, Hughes and Gorrill (1955) treated 200 asthmatic children for one year. They compared the effect of regular injections of autogenous bacterial vaccines with regular injections of carbol saline. In both groups 50% of the patients were improved by the treatment.

*Use of Antihistamine Drugs.*

Schild *et alii* (1951) showed that high concentrations of antihistamine drugs prevented specific antigens from producing contraction of bronchial muscles in isolated tissues from asthmatic subjects. These drugs have proved disappointing in the management of asthma, and may actually cause bronchoconstriction in some patients. However, many physicians claim that an antihistaminic such as "Phenergan" alleviates concomitant nasal symptoms, and that an elixir of "Benadryl" is useful for the young child with excessive bronchial secretions.

*Corticosteroid Therapy.*

Corticosteroids have been given to patients with asthma because it is thought that they may prevent the damaging effects of antigen-antibody union. In 1956 two reports were submitted to the Medical Research Council of the United Kingdom by the Subcommittee on Clinical Trials in Asthma. In the first, cortisone or placebo tablets were given for a period of six weeks to 96 adult patients suffering from chronic asthma, and neither the patients nor the observing doctors were aware of the nature of the tablets taken by individual patients. The group receiving cortisone showed improvement during the early weeks, but this was not maintained. Two weeks after the treatment was stopped, no difference was found between the two groups. The second report was concerned with patients suffering from status asthmaticus. Cortisone-treated patients appeared to respond better than the control subjects, but conventional therapy was remarkably successful in both groups.

Savidge and Brockbank (1954) stated that individual patients with severe chronic asthma were benefited by prolonged oral cortisone therapy, but in another paper reported two sudden and unexpected deaths in the group. Kennedy and Thursby-Pelham (1956) studied 12 children suffering from chronic asthma, and found that all had impaired ventilatory function as determined by the "expiratory flow rate" test which they devised. The "double blind" method of investigation was used, cortisone and placebo being given to each child for periods of six weeks. Ventilatory function improved only when the child was given more than 50 mg. of cortisone daily. In a later paper (Thursby-Pelham and Kennedy, 1958) they reported that prednisolone appeared slightly better than equivalent doses of cortisone.

It has been shown (Pinkerton and van Metre, 1958) that there is a lag period of some hours between the administration of steroids and alleviation of symptoms, and this is not dependent on the type of steroid used, or on whether it is given orally or by intravenous injection.

*Summary.*—From the foregoing and other reports (Abesman and Ehrenreich, 1956; Baldwin, Gara, Spielman and Dworetzky, 1955; Burrage and Irwin, 1953; Irwin and Burrage, 1958) the use of corticosteroids in childhood asthma may be summarized in the following way.

Steroid therapy will not cure asthma, but will generally relieve an acute attack, sometimes in a dramatic manner. It should be used for the distressed and exhausted child when other methods of treatment have failed. When given concomitantly with adrenaline and other anti-asthmatic treatment, it may be life-saving for the acutely ill child. Most authors suggest a large dosage in the first 24 hours, and gradual withdrawal as soon as the attack is relieved. Except in the case of infants, the dose used should be related to the severity of the attack rather than to the weight of the patient. Prednisolone and prednisone are possibly more effective than cortisone, hydrocortisone and ACTH, and have fewer undesirable side-effects.

Results are often disappointing in chronically ill children with impaired ventilatory function, but individual patients may be improved by maintenance steroid therapy. However, the child with chronic asthma should not be subjected to the hazards of prolonged steroid therapy until all other methods have failed. If such a child is relieved by steroids, the dose should be gradually reduced until the amount used daily is the minimum necessary for control of symptoms. Complete withdrawal should be attempted as soon as possible.

*Comment.*—There appear to be few risks attached to the use of corticosteroids even in large doses, provided the period of administration is short. Cardiac failure or acute infection may contraindicate this form of therapy, and the indications should be carefully weighed in relation to patients with impaired renal function, tuberculosis or mental disorders. There are few well-documented accounts of prolonged administration of steroids to asthmatic children. However, it is true that steroid therapy continued for more than a few weeks always produces side effects and entails a risk to the patient. In children, the signs of hypercorticism include increased appetite with facial "mooning" and obesity, hirsutism and sometimes acne and hypertension. Gastric ulceration is extremely rare in childhood, mental disturbances are uncommon and potassium depletion is not usually a problem. Impairment of growth and osteoporosis are additional hazards. The appearance and severity of side effects depend on the dose, the duration of administration and the type of preparation used. Prednisone and prednisolone in equivalent doses produce fewer side effects than cortisone, hydrocortisone and ACTH, and methylprenisolone and triamcinalone appear to be the least harmful. The possibility of adrenal failure during and after periods of prolonged steroid administration still seems real, although this risk has not been accurately assessed. The hazard of severe and overwhelming infection is associated with such therapy, and cannot be ignored.

*General Measures Designed to Reduce Hypersensitivity.*

Every asthmatic attack is provoked by one or more specific factors. It is possible that the reactivity of an individual varies at different times. Many authorities believe that treatment aimed at altering the reactivity of the patient is the most vital part of therapy. Measures that can be taken to achieve this object will be included later, when the general management of the asthmatic child is discussed.

An interesting example of this approach has recently been reported by Mason and Black (1958). An adult female patient with a long history of allergic hay-fever and asthma was completely relieved of symptoms by hypnosis. Skin tests at weekly intervals revealed decreasing sensitivity to known allergens. When the patient was free of symptoms and the responses to skin tests were negative, intradermal injection of the patient's serum into a non-allergic volunteer still passively transferred the skin sensitivity to the original allergens (Prausnitz-Kustner reaction).

**Practical Management of the Asthmatic Child.**

The practical aspects of management of an individual child must be considered against the background of his family and environment. Almost any treatment will relieve asthma for a period; but continued success depends largely on the personality and interest of the doctor and on his ability to inspire the family with confidence. Time is well spent in giving parents some explanation of the mechanism and causes of asthma, and the older child will appreciate opportunities to discuss his symptoms. The purpose of the various tests should be explained, and the parents should have a clear idea of the treatment planned. Regular visits to the doctor are desirable so that preventive aspects can be emphasized. Every parent must know the procedure to be followed if prodromal symptoms appear or if asthma actually develops. Written instructions are often helpful, and tablets and mixtures must be clearly labelled. Panic and confusion, which are so deleterious to the asthmatic patient, may then be avoided.

The practical management of the asthmatic child will be discussed under five headings: (i) management of the child between attacks; (ii) prophylaxis of an impending attack; (iii) treatment of an acute asthmatic episode; (iv) treatment of status asthmaticus; (v) management of the child who has severe chronic asthma.

*Management of the Child between Attacks.*

Obviously every effort should be made to establish the nature of the offending allergens, and methods for doing this have already been outlined. In some cases the allergens can be easily avoided, but occasionally hyposensitization is indicated. The prevention and treatment of infection are often of prime importance.

However, the doctor and family should also aim to make the child less reactive to the various "triggers" which provoke attacks. A gradual "toughening-up" régime should be undertaken, and the child should be encouraged to lead a normal life. Much will be achieved if such things as cotton singlets, cool showers, regular swimming and physical culture classes can take the place of "coddling" and limited activities.

It is generally held that there is a large psychosomatic element in asthma. The asthmatic child is usually intelligent but anxious, dependent, sensitive, easily upset and lacking in self-confidence. His parents are often intelligent, ambitious and sensitive, and frequently suffer from allergies themselves. They often feel responsible for the child's condition, and adopt a pitying and over-anxious attitude towards him. The doctor should try to build up a feeling of confidence within the family group. Parental management must be consistent and unemotional. Many parents adopt a gloomy, negative and apprehensive attitude towards their asthmatic child, and improvement will follow if this can be replaced by confidence, spontaneous affection and a sense of humour. Sedatives and tranquillizers often help asthmatic children. Phenobarbitone is commonly employed and, when given regularly for a long period, may reduce the number of attacks. A suitable dose of phenobarbitone for most age goups is 15 mg. three times a day. Some physicians perfer to use methylpentynol ("Oblivon") in a dose of 250 mg. twice a day for a child of six years, or methylpentynol carbamate ("Oblivon C") in a dose of 100 mg. twice a day for a child of the same age. Recently chlorpromazine and other tranquillizers have been used with success in individual cases, but with little evidence of their general superiority.

Physiotherapy may produce surprising results, and is of psychological value because it is something positive that the child can do for himself every day. Breathing exercises have been described in a booklet published by the Asthma Research Council, "Exercises for Asthma and Emphysema", but initial training by a physiotherapist is advisable. Some children enjoy attending organized classes, but the exercises should be performed twice each day. Bronchial spasm may be relieved if the child does his exercises at the first sign of wheeze or tightness in the chest.

Extra calories in the form of glucose drinks and protein foods may help to improve the general health of the asthmatic child, who is usually thin and overactive; but fatty foods are not well tolerated. Overexertion and excessive fatigue should be avoided, and regular holidays away from the usual environment should be planned. In resistant cases, "parentectomy" has been known to give dramatic results when all else has failed.

*Prophylaxis of an Impending Attack.*

Glaser (1957) noted that 80% of asthmatic attacks in childhood were heralded by prodromal symptoms. Sneezing and nasal discharge are the most common, but cough and breathlessness on exertion are also frequently observed. When any of these symptoms occur, the mother must immediately follow the procedure which has been previously defined for her. Young children are confined to bed, but it is usually sufficient to keep older children indoors. An antihistamine can be given at four-hourly intervals. An elixir of "Benadryl" is commonly used, and the dose should be such that a maximum of 5 mg. per kilogram of body weight is given in 24 hours. Ephedrine is sometimes added to this mixture, or alternatively, an elixir or tablet containing ephedrine and phenobarbitone can be given every four or six hours, especially if there is wheezing. Doses of 15 mg. of ephedrine and 10 mg. of phenobarbitone are suitable for a six-year-old child. Occasionally an expectorant or a sedative cough mixture may be indicated. If more definite symptoms develop, a rectal suppository containing 0·25 gramme of aminophylline may be used. In some patients infection is the usual precursor of asthma, and these patients should be given penicillin orally or a sulphonamide at the first sign of respiratory symptoms. Injections of penicillin are best avoided, because asthmatic subjects may become sensitized. Obviously, if sedatives and penicillin or a sulphonamide are being used for prophylaxis, they should be continued during an attack, and extra breathing exercises should be encouraged.

Usually the foregoing régime can be instituted and managed by the parents without further reference to the family doctor.

*Treatment of an Acute Asthmatic Episode.*

Bed rest is desirable, and the measures outlined earlier for aborting an attack are followed, except that antihistamines should be used only if the secretions are plentiful. If these measures are not successful, "Neo-epinine" or "Isuprel" should be administered sublingually, or some preparation containing aminophylline or a combination of antispasmodics and sedatives should be given at four-hourly intervals in appropriate doses. For older children sprays containing adrenaline aerosol or "Neo-epinine" may be advised; but overdosage due to excessive use is a hazard. If relief is not obtained within a reasonable time, or if the initial symptoms are severe,

a hypodermic injection of adrenaline is necessary. This should not be unreasonably delayed, because the response to adrenaline is better in the early stages. For a six-year-old child 0·3 ml. of a 1 in 1000 solution of adrenaline tartrate may be injected, and this can be repeated every 20 minutes for three doses. A more prolonged effect can be obtained by injecting intramuscularly 0·5 ml. of a 1 in 500 suspension of adrenaline in oil at the same time as the hypodermic injections. The intramuscular injection can be repeated after 12 hours. Adrenaline injections or sprays should not be used for at least four hours after "Neo-epinine" or "Isuprel", because sudden death has been reported when these drugs have been used in rapid succession.

An adequate fluid intake is essential. Cough may be troublesome, as the secretions tend to be sticky and difficult to expectorate, and potassium iodide or syrup of ipecacuanha may help. Sedatives such as chloral hydrate, barbiturates or even paraldehyde should be given to allay anxiety and to ensure sleep. Morphine is contraindicated. Treatment should be continued after the attack has been relieved until all symptoms and signs disappear.

*Treatment of Status Asthmaticus.*

Status asthmaticus is a severe and prolonged attack of asthma which fails to respond to the measures already outlined. Admission of the patient to hospital may be advisable; but not all agree with the routine of Unger *et alii* (1958), who admit all patients with status asthmaticus to specially equipped and furnished rooms free from noise, draughts, flowers, dust and smoke, and fitted with air filters on the windows. Admission to the usual hospital room or ward is necessary for the very sick child; but most children are better treated at home, provided the mother is capable and confident. Admission to hospital of an asthmatic child can easily become a necessary ritual before an attack is relieved, and should therefore be avoided if possible.

An adequate fluid intake is essential for the patient with status asthmaticus, but it may be difficult to achieve, especially when vomiting is persistent, as it often is. Intravenous therapy is necessary if dehydration occurs. Oxygen should be administered in a tent, particularly when there is superadded bronchitis, and excessive secretion must be removed from the upper respiratory passages by suction. Therapeutic doses of antibiotics are required when infection is a preceding or complicating factor. Moderate or even heavy sedation is necessary. Adrenaline is administered until it is apparent that the condition has become "adrenaline-fast". When this occurs, aminophylline (0·125 gramme for a six-year-old child) given by intravenous injection may give dramatic relief, but it causes vomiting and abdominal pain in some children. It must be injected slowly, preferably in 150 to 200 ml. of 10% glucose solution.

Steroids can be life-saving for acutely ill patients, and are indicated also for the treatment of severe attacks when other methods have failed to give relief. There is no uniformity in the type of preparation or the dosage schedule recommended by various authorities. A scheme for the treatment of status asthmaticus in childhood will be outlined; but the response to this type of therapy is variable, and the dose and preparation may have to be altered. Fortunately this condition is rare in infancy; but it must be remembered that smaller doses than those listed would be required for infants.

A large initial dose is always required. If the patient is vomiting, hydrocortisone should be given by parenteral injection in a dose of 75 mg. per 24 hours. It can be given intravenously with other agents when intravenous therapy had already been instituted, or it may be injected intramuscularly in divided doses. When the patient is able to tolerate oral therapy, prednisolone is the drug of choice, and 10 to 15 mg. should be given every six hours. Larger amounts may be given to critically ill patients, but in all instances the daily amount should be reduced rapidly after relief has been obtained, and when possible administration should be discontinued in about 10 or 14 days after commencement. If a maintenance dose of steroid is contemplated, the dose should be more gradually reduced until the smallest amount which provides freedom from symptoms is reached. During the period of high steroid dosage it is advisable to limit sodium intake, and the possibility of sodium and water retention, with sudden weight increase or hypertension, must be remembered. Extra potassium salts are rarely necessary for children. Finally, it must be pointed out that even when steroid therapy has been commenced, the administration of other anti-asthmatic agents should be continued, because there is always a lag period before the steroids produce relief.

The occurrence of status asthmaticus is a frightening experience for any child, and is disappointing for the family and the attending doctor. The patient and his parents will require skilful management to restore their confidence after such an episode; but any severe attack should provide a stimulus for further efforts to establish the ætiology and for the taking of additional preventive measures.

*Management of the Child who has Severe Chronic Asthma.*

Occasionally a child has long periods in which he is never free from the symptoms and signs of asthma. His physical and mental development is adversely affected, and eventually irreversible lung changes occur. Every method of investigation to define the ætiology must be used. The treatment described in the section on management of the child between attacks should be followed, and in addition antispasmodics should be administered regularly. Infections, particularly of the upper respiratory passages, may require treatment. It is worth noting that a complete change of environment frequently results in improvement, and this is sometimes maintained on the child's return to the home.

Apart from its use in status asthmaticus, steroid therapy is best reserved for the chronically ill patient who has been thoroughly investigated, and for whom no successful treatment has been found. In spite of the risks, it should not be indefinitely delayed if the child's activities are greatly restricted and his general health is impaired by the disease. In a proportion of cases, symptoms may be relieved or diminished and normal activities resumed. The type of steroid and the dosage used are variable, but one schedule using prednisolone suitable for most children will be outlined.

The dose given in the first 24 hours should be large — for example, 40 to 60 mg. of prenisolone. The initial dosage is continued until symptoms are relieved, and then reduced by 10 mg. each day until only 20 mg. are being taken. Further reduction is effected at a slower rate, until the minimum amount necessary to keep the patient free of symptoms is reached. This daily maintenance dose usually lies between 10 and 15 mg. of prednisolone, but may be as low as 5 mg. or higher than 20 mg. At various times it may be necessary to increase the dose for a short period. Complete withdrawal should be attempted after about two months; but steroid therapy may have to be continued for many months and occasionally for years. There is some risk of sudden adrenal failure, either during or after cessation of prolonged steroid administration. Consequently such stresses as accidents, operations, asthmatic attacks and severe illnesses should be "covered" by increased dosage or by readministration of steroids for a short period.

*Summary.*

A summary of the principal prophylactic and therapeutic measures which may be used for asthma in childhood is shown in Table II.

**Epilogue.**

What can be expected to result from the prolonged, expensive and tedious treatment of an asthmatic child?

There is a tendency for this disease to subside at puberty; but it may continue throughout life and sometimes becomes worse. Some children lose their asthmatic symptoms, but acquire hay-fever or some other allergic manifestation.

Rakeman and Edwards (1952) reviewed 449 adults who had had asthma during childhood; 20 years later the position was as follows: 138 (30·7%) were completely relieved; 87 (19·3%) were symptomless, provided they avoided the allergens causing asthma; 96 (21·4%) had no asthma, but had other allergic symptoms; 117 (26·0%) had asthma, 49 (10·9%) with severe symptoms; 4 (1%) had died because of asthma; 7 (1·7%) had died from unrelated conditions.

TABLE II.

*Summary of the Principal Measures to be Taken in Treating Asthma in Childhood.*

| Clinical Condition. | Items of Therapy. |
|---|---|
| Between attacks | Establish ætiology.<br>Remove known allergens.<br>Hyposensitization.<br>Psychotherapy—tranquillizers, sedatives.<br>"Toughen-up" child—extra calories.<br>Physiotherapy.<br>Control infections. |
| Impending attacks | Confine to bed or keep indoors.<br>Antihistamines.<br>Ephedrine and phenobarbitone.<br>Perhaps aminophylline.<br>Penicillin.<br>Breathing exercises. |
| Acute asthmatic attack. | As above, but no antihistamines.<br>"Neo-epinine" or "Isuprel".<br>Adrenaline. (Important note: Not after "Neo-epinine" or "Isuprel".)<br>Fluids.<br>Expectorants.<br>Sedatives. |
| Status asthmaticus | Fluids and oxygen.<br>Antibiotics.<br>Sedatives.<br>Adrenaline.<br>Aminophylline.<br>Occasionally admission to hospital.<br>Sometimes steroids. |
| Severe chronic asthma. | Antispasmodics.<br>Antibiotics.<br>Physiotherapy.<br>Sometimes steroids.<br>Environmental change. |

The outlook for any particular child is difficult to assess at the outset of his illness. He is unlikely to die in childhood from his complaint; but he may experience periodic disabling attacks of asthma, and these sometimes continue into adult life. His education and his health may be affected, and his choice of occupation may be limited. Successful treatment undoubtedly improves the prognosis. Both doctor and patient must therefore be tenacious in seeking the ætiological and provoking agents, and in exploring all possible methods of prophylaxis and therapy.

Asthma is the commonest of all chronic illnesses affecting children, and many adults continue to suffer from the disease which they acquired in childhood. Methods of investigation and treatment are therefore not completely satisfactory. The high incidence, the scanty knowledge of basic ætiology and the unsatisfactory results of treatment present a challenge to all physicians.

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## ANÆMIA AMONG COCOS ISLANDERS: A SURVEY.


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WHEN the writer was medical officer in the Department of Territories, Cocos (Keeling) Islands, the opportunity arose to determine the hæmoglobin values of the entire native population of Home Island. This island is one of the largest in the atoll and was settled by the Clunies-Ross family in 1827 with Malayan workers. It has remained a self-contained community ever since. The estate workers collect coconuts from the other islands and process them on Home Island. The survey of hæmoglobin values showed that many subjects were suffering from anæmia, although they were leading active lives. An attempt was made to correct the anæmia by administering iron salts, and the effect of this therapy was investigated by subsequent measurement of the hæmoglobin values. This paper reports the results of the survey.

### Subjects and Methods.

None of the subjects had reported for medical attention, and, apart from occasional giddiness and headache, none complained of symptoms which could be attributed to

anæmia. Active tuberculosis, leprosy and syphilis were not seen, and malaria is absent from the islands. *Ascaris* infection is widespread and may interfere with hæmoglobin production by inhibiting the action of pepsin and trypsin on protein-bound iron in food. The incidence of *Ancylostoma* infestation is not known, but examination of large quantities of excreted worms revealed *Ascaris* only. The diet consists of fish, rice, flour, cane sugar, coconut oil and fruit (papaya, bananas, guavas). Sweets, sweet biscuits and cordials are available for purchase at the store on the island. The ages of all the subjects were obtained from the register of births.

Specimens of blood were obtained from adults and children by pricking the pulp of the right middle finger with a straight triangular cutting needle. Blood was obtained from infants by pricking the heel. In all instances the puncture was repeated if blood did not flow easily, to avoid the expression of tissue fluid into the sample.

A Hellige comparator was used for the measurement. A small amount of 0·1 N hydrochloric acid was placed in the tube and 20 c.mm. of blood were added. After an interval of five minutes water was added with mixing until the colour matched the standard glass. Natural daylight was always used for comparing colours. When the hæmoglobin value was less than 5 grammes per 100 ml., two or three times the amount of blood was added to the acid and the result appropriately divided. The calibration of the Hellige hæmoglobinometer and pipettes was checked before the survey was commenced and at three-monthly intervals against samples obtained from the New South Wales Red Cross Blood Transfusion Service. The hæmoglobin content of these samples had been checked at the National Standards Laboratory, C.S.I.R.O., Sydney. In view of the low results, arrangements were subsequently made for the instrument and pipettes to be sent to Sydney, where the writer checked the calibration against further samples supplied by the Red Cross Blood Transfusion Service; but no change in calibration was necessary.

After the initial survey all subjects with a hæmoglobin value of less than 11·6 grammes per 100 ml. were given iron orally and were retested seven weeks after therapy. Those whose values had not risen to above 11·5 grammes per 100 ml. were given a further course of therapy and tested a third time twenty weeks later. In each trial there were, of course, a number of defaulters, but the majority persisted, and none refused to allow further hæmoglobin estimations. Adults were given two tablets, each containing five grains of ferrous sulphate, three times a day if the initial hæmoglobin value was less than 5·8 grammes per 100 ml., and one tablet three times a day if the initial value was above 5·8 grammes per 100 ml. Babies and young children were given 0·25 ml. of an elixir containing 51 mg. of ferrous gluconate per millilitre. The pills were distributed personally by two medical orderlies at the rate of approximately 1000 pills per day, and it is believed that nearly every subject took them. This supervised distribution was possible because the whole village is very compact. It is of interest that in the native population undesirable side-effects of iron therapy were minimal.

## Results.

The mean hæmoglobin values and the standard deviations are shown by age and sex in Table I. In the older age groups only small numbers were tested, but the values are included for completeness. At all ages and in both sexes the mean hæmoglobin values are low and generally the standard deviations are large compared with values found in the European populations of either the United Kingdom or Australia. The large standard deviations indicate that some subjects with very low hæmoglobin values were found. For example, three subjects had values less than 4·5 grammes per 100 ml. amongst the females in the 11 to 15 years age group. During the reproductive period of life there were some significant sex differences, but, unlike the European populations, this was not a constant feature.

The results of the therapeutic trials are shown in Table II. It can be seen that the mean hæmoglobin value increased from 8·45 grammes per 100 ml. to 10·8 grammes per 100 ml., which is a significant increase. However, there were many subjects who showed no response and only a minority whose values rose above 11·5 grammes per 100 ml. The second period of therapy produced a smaller and not significant increase. It is obvious that many were resistant to iron given orally, because the mean value was less than that at the conclusion of the first period of therapy. The effect of iron given parenterally could not be evaluated because there is a universal objection to intravenous injections as a result of the unsuccessful use of glucose-saline solutions given intravenously for children during an epidemic of gastro-enteritis some years previously. Iron could not be given intramuscularly into the buttock because of religious objections.

TABLE I.

*Hæmoglobin Values (Grammes per 100 ml.) at Different Ages.*

| Age Group. (Years.) | Males. | | | Females. | | |
|---|---|---|---|---|---|---|
| | Number. | Mean Value. | Standard Deviation. | Number. | Mean Value. | Standard Deviation. |
| 0 to 5 .. | 37 | 7·06 | 2·04 | 45 | 6·68 | 2·34 |
| 6 to 10 .. | 45 | 9·91 | 2·06 | 36 | 9·16 | 2·13 |
| 11 to 15 .. | 32 | 10·01 | 2·12 | 36 | 9·80 | 2·43 |
| 16 to 20 .. | 21 | 10·58 | 2·12 | 25 | 10·34 | 1·55 |
| 21 to 25 .. | 20 | 11·95 | 1·48 | 19 | 10·88 | 1·72 |
| 26 to 30 .. | 6 | 12·11 | 1·24 | 16 | 10·40 | 2·66 |
| 31 to 35 .. | 8 | 12·15 | 0·92 | 6 | 9·28 | 1·67 |
| 36 to 40 .. | 17 | 12·13 | 1·84 | 18 | 8·69 | 2·57 |
| 41 to 45 .. | 10 | 11·08 | 1·14 | 12 | 10·53 | 2·66 |
| 46 to 50 .. | 8 | 11·90 | 0·58 | 4 | 7·65 | 1·87 |
| 51 and over .. | 12 | 11·03 | 1·54 | 9 | 10·00 | 2·27 |

TABLE II.

*Results of Administering Iron Salts to Anæmic Subjects of All Ages.*

| Time of Test. | Numbers. | Mean Hæmoglobin Value. (Grammes per 100 ml.) | Standard Deviation. |
|---|---|---|---|
| Before treatment of subjects with less than 11·6 grammes per 100 ml. on first testing .. .. | 317 | 8·45 | 2·20 |
| After treatment with iron salts .. .. .. | 317 | 10·80 | 2·14 |
| Before second treatment of subjects with less than 11·6 grammes per 100 ml. after first treatment .. | 212 | 9·03 | 1·83 |
| After second treatment with iron salts .. .. | 212 | 9·27 | 2·28 |

## Discussion.

The mean hæmoglobin values reported in this paper are the lowest found in any population which has so far been investigated. The technique of measurement is not as accurate as that which has been used by other workers, but the calibration of the instrument was carefully checked before, during and after the survey. Therefore, it probably represents the hæmoglobin status of the population correctly; but the standard deviations are larger than would have been obtained if a more accurate technique had been used.

Population anæmia may be genetically determined involving the chemical structure of the hæmoglobin molecules. This possibility cannot be overlooked in a small confined population such as inhabits Home Island,

but it has not been specifically investigated in the present work.

Theoretically, the anæmia could be the result of malaria, parasitic infestation, or nutritional iron and protein deficiency with reduced dietary intake of vitamins or trace metals, or chronic blood loss. Malaria has never been detected at Cocos either among the indigenous inhabitants or among the Australians who work there for two years without prophylactic therapy. This applies also to hookworm infestation, although, as mentioned above, *Ascaris* infestation is heavy among the Home islanders. The present work was not aimed at defining the causative factors, but it seems unlikely that iron deficiency plays a major role. The hæmoglobin values of some subjects were increased by iron given orally, but few were raised to levels comparable with those found in Europeans. The possibility of impaired absorption of orally administered iron was not eliminated by the survey.

**Summary.**

A survey of the hæmoglobin values of the native population of Home Island in the Cocos (Keeling) Islands disclosed low values at all ages. Little response was obtained from orally administered iron salts, and the causation of the anæmia remains obscure.

**Acknowledgements.**

The writer acknowledges with thanks the permission and assistance in carrying out the work given by Mr. John Clunies-Ross, and the practical help also given by Mrs. Clunies-Ross and by Mr. and Mrs. Pat Keegan.

The help given by Dr. R. J. Walsh, Director of the N.S.W. Red Cross Blood Transfusion Service, in the preparation of the article is gratefully acknowledged.

# Reports of Cases.

## RADIOLOGICAL DETECTION OF MECKEL'S DIVERTICULUM.

By SIR BENJAMIN EDYE, K. B. VOSS AND E. G. H. MANCHESTER,

*Sydney.*

MECKEL'S DIVERTICULUM is a developmental anomaly of the gastro-intestinal tract found in 1% to 2% of individuals. It is due to persistence of the proximal portion of the omphalo-mesenteric duct, which normally atrophies during early fœtal life. Its structure is usually similar to that of the bowel wall, but heterotopic tissue may be found in it. Despite the relative frequency of the condition, it is rarely diagnosed before operation or post-mortem examination.

Stein *et alii* (1958), in a review of the literature in the English language, found detailed reports of only 33 instances in which a röntgen diagnosis of Meckel's diverticulum was made before operation.

The difficulty encountered in filling a Meckel's diverticulum with opaque material during the course of a barium meal X-ray examination is well known, and is further illustrated by the failure to duplicate the findings in the following case.

### Clinical Record.

The patient, a male, aged 56 years, was seen when he complained of a persistent pain radiating down the right side of the abdomen. Seven months previously he had been operated upon for epigastric hernia, prior to which he had had pain intermittently, and since then he had had pain of a different character. He stated that the attacks might last for twenty-four hours, during which time he felt very sick and wanted to vomit. He could not eat during an attack. Since coming to Sydney four weeks previously he had suffered three attacks, and thought that he had a blockage of his bowel, as he was constipated during these bouts, although the constipation was relieved by an aperient. He had lost over 14 lb. (6·4 kg.) in the previous year. Since the age of 22 years he had lived in Fiji. In addition to the operation for epigastric hernia, his appendix had been removed 40 years previously for chronic appendicitis, and he had had an operation for osteomyelitis performed on his right femur.

On examination, the patient was seen to be a man of medium build, of a florid, tremulous type. He had obviously lost weight. Inspection of the abdomen showed a scaphoid abdominal wall, with a recent mid-line epigastric scar, and there was an ugly depressed Battle incision in the right lower quadrant. The site of the pain was immediately above this.

An opaque meal and follow-through X-ray examination revealed no abnormality in the stomach or duodenum. On examination 24 hours after the ingestion of the meal, the large bowel appeared normal. Just above the sigmoid colon, in which the density of the barium was not marked, there was seen to be an ovoid shadow, of considerably greater density, not attached or related to the colon or rectum (Figure I). In view of the site and density, this

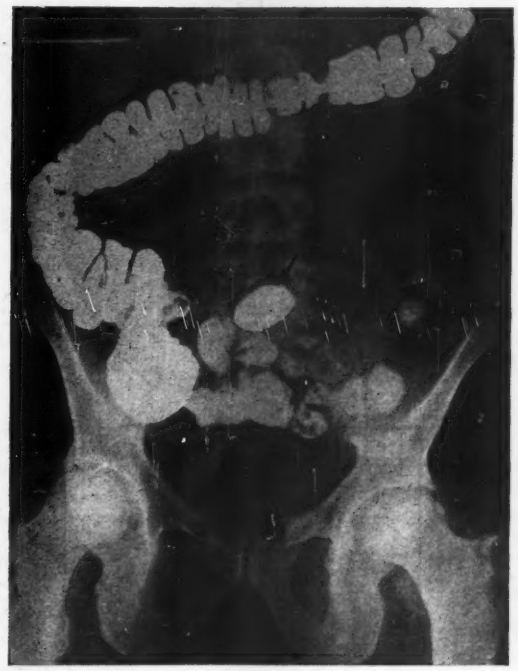

FIGURE I.

was considered to be a diverticulum of the small bowel, almost certainly a Meckel's diverticulum.

An opaque enema X-ray examination confirmed the normal appearance of the large bowel. The diverticulum was not filled, but the more precise definition of the sigmoid colon confirmed that there was no possibility of its being attached to this region. A second opaque meal X-ray examination was made in an attempt to demonstrate the attachment to the ileum, but in this examination the diverticulum did not fill.

At operation, a right upper paramedian incision was made, splitting the rectus. The abdomen was fully examined. There were scattered adhesions, some cord-like, in relation to the caecum and ascending colon. These

were divided, although none seemed very harmful. The liver and gall-bladder were found to be normal. The duodenum showed no evidence of ulceration, either active or chronic. The stomach was normal. The pancreas was indurated throughout, indicating a well-established chronic pancreatitis. The colon was normal to palpation, especially the parts that were seen. The small bowel was normal and not involved in any adhesion.


FIGURE II.

However, there was a Meckel's diverticulum, about six inches (15·25 cm.) long, arising about four feet (1·22 metres) from the caecum. It was clamped half an inch (1·3 cm.) from the bowel and excised. The bowel was closed in two layers. The adhesions were surprisingly scanty, and none seemed likely to cause symptoms. The piece of tissue removed was immediately placed in spirit, but shrank to an amazing degree within a short time, as is evidenced by the pathological report as follows:

"Specimen was a cylindrical piece of intestine 4 cm. long, 1·9 cm. in diameter. There was a lumen only at one end. At one border there was some adipose tissue. The cut surface showed the general architecture of the small intestine with a little soft fæces at one end (alcohol-fixed)." (Figure II.)

This was a case of Meckel's diverticulum, lined by intestinal mucosa.

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ANDERSON, W. A. D. (1952), "Synopsis of Pathology", Mosby Company.

STEIN, G. N., BENNETT, H. H., and FINKELSTEIN, A. (1958), "The Pre-Operative Roentgen Diagnosis of Meckel's Diverticulum in Adults", *Amer. J. Roentgenol.*, 79: 815.

## PSYCHOSIS WITH MYXŒDEMA: REPORT OF A CASE.

By C. S. HAUGHTON,
*Receiving House, Royal Park, Victoria.*

IT has been known at least since 1888 that an organic psychosis can result from myxœdema. Asher (1949) again drew attention to the association of psychosis with myxœdema when he described 14 cases of "myxœdematous madness". In some of these cases the myxœdema was recognized only after the onset of the psychosis. Rullo and Allan (1958) have also described one such case. Calvert *et alii* (1954) have described coexistent myxœdema heart disease and psychosis, and state that there is no constant psychotic picture in myxœdema, the personality changes covering the wide range of mania, irritable and suspicious character, self-accusation, delusions, hallucinations, melancholia, a schizoid state and, rarely, suicidal attempts. The following case shows many of the above-mentioned features.

### Clinical Record.

The patient, a housewife aged 36 years, was admitted voluntarily to the Receiving House, Royal Park, on August 22, 1958. The referring doctor's letter stated that she was very distressed, had wandered away from home and attempted suicide, and was thought to be schizophrenic. The patient's mother stated that the patient had always been quiet and shut-in as a child, but that this tendency had become more pronounced since her marriage five years previously. Since her marriage she had had recurrent "depressive attacks", which involved mutism and shutting herself in her room. Two weeks prior to her admission to hospital she began to talk to her mother about the "voices" which were worrying her, often suggesting suicide. Since then her conduct had been more disturbed. A few nights prior to admission to hospital she had wandered away from home, and was found three miles away in a state of confusion.

On examination she was very depressed, weeping and tense. She appeared to be of dull normal intelligence. She stated that she was seeing moving shapes in her room at night, which frightened her. She talked of good worms and bad worms fighting in her head, and said that the bad worms were winning. She also said she could hear a good voice and a bad voice; the bad voice told her to kill her mother, her husband and herself, and the good voice said not to. She stated that the bad voice was winning, and told of an occasion four months previously when she had seized her husband by the throat while he lay asleep beside her. She said she was very depressed and wanted to die.

On physical examination the patient was tall and heavily built. She talked and walked slowly. Her face was bloated and sallow, with a malar flush and thick lips. Her skin was coarse and her voice was deep. Her hair was coarse, with a tendency to fall out, and her eyebrows were scanty on the outer aspects. Her pulse rate was 66 per minute and her blood pressure 100/60 mm. of mercury. There was ankle œdema and dyspnœa on exertion. Her thyroid gland was normal on palpation.

The blood cholesterol level was 500 mg. per 100 ml., the protein-bound iodine level 0·3 µg. per 100 ml., and the hæmoglobin value 10·3 grammes per 100 ml. The electrocardiogram showed an abnormally low voltage with a

greatly prolonged *Q–T* interval and inverted *T* waves in leads 1 and 2.

FIGURE I.
The patient on her admission to hospital, August 27, 1958.

Because of her distressed mental state on her admission to hospital, the patient was placed on chlorpromazine, 200 mg. three times a day by mouth, while investigations

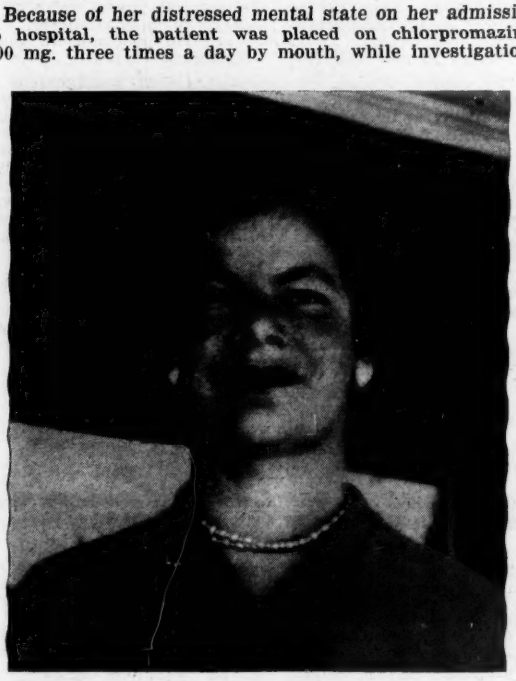

FIGURE II.
The patient on October 28, 1958.

were carried out. She was started cautiously on a small dose of thyroid extract, 15 mg. daily; this was gradually increased over the next four weeks to 240 mg. daily, and then treatment was continued on this dosage. There was marked improvement in her physical appearance, as shown by the photographic test of Asher (1949) applied before and after treatment (compare Figures I and II). She lost nearly a stone in weight in eight weeks, and she became more energetic and alert. Her voice lost its deep quality, and her mental state gradually improved. The blood cholesterol level fell to 160 mg. per 100 ml., and the electrocardiogram, compared with the first record, showed increased amplitude, *Q–T* interval reduced to within normal limits and upright *T* waves in lead 2. Menstruation, which had previously been heavy and prolonged, became more normal. An attempt was made to discontinue the chlorpromazine. However, the patient became upset after one day and asked for the tablets to be continued. This was done on the smaller dose of 50 mg. three times daily. She was discharged from hospital on October 24 on thyroid extract, 240 mg. daily, and chlorpromazine. The latter has since been discontinued, and the patient has remained well.

### Comment.

This case illustrates how easily myxœdema can be overlooked when the onset is an insidious one. The only physical change her mother had noticed was a thickening of the patient's skin three years previously, while no change was obvious to her husband. Her general appearance had caused one doctor to tell her not to drink so much. During treatment at a sterility clinic one year prior to her admission to hospital, the myxœdema was not recognized, though it may not have been fully developed at that time. The onset of a psychosis resulted in the underlying myxœdema being recognized. Whether the psychosis would have responded to thyroid extract alone without the use of chlorpromazine is difficult to know.

### Summary.

A case of myxœdema psychosis is described. Treatment with thyroid extract and chlorpromazine resulted in the disappearance of the myxœdema and the psychosis.

### Acknowledgements.

I should like to thank the Mental Hygiene Authority of Victoria for permission to publish details of this case, and Dr. J. Cade, Psychiatrist-Superintendent of the Receiving House, Royal Park, for his helpful advice.

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RULLO, F. R., and ALLAN, F. N. (1958), "Psychosis Resulting from Myxedema", *J. Amer. med. Ass.*, 168: 890.

## Reviews.

**Tumors of the Lungs and Mediastinum.** By B. M. Ffied, M.D., F.C.C.P.; 1958. Philadelphia: Lea and Febiger. Sydney: Angus and Robertson, Limited. 9" × 5¾", pp. 468, with 231 illustrations. Price: £7 8s. 6d.

THIS is an extension of a book by the same author published in 1948 under the title "Bronchiogenic Carcinoma and Adenoma". It is half as large again as the earlier work, and contains chapters by six special contributors on radiology, pulmonary function, surgical treatment, radiotherapy and radiodiagnosis of mediastinal tumours. The book is comprehensive, and discusses practically all aspects of lung cancer. It is interesting to compare the statement in 1948, that "evidence thus far adduced is contrary to the idea that bronchiogenic [*sic*] cancer is caused by tobacco", with the author's current view, that figures compiled by American and British investigators pertaining to the association of cancer of the lung with cigarette smoking show beyond a doubt that "cancer of the lung occurs with much greater frequency in heavy

smokers of cigarettes than in non-smokers". However, he goes on to state that the figures have not yielded irrefutable evidence of an ætiological relationship between the two.

Although the author displays a wide knowledge of his subject, some of his statements are open to question; one such is the assertion that "there has probably never been a case of cancer of the lung which has not been diagnosed at the outset as pneumonia". In discussing bronchial carcinoma in asthmatics, the author mentions the danger of overlooking the development of carcinoma in such a patient, but neglects to mention the definite possibility that mucoid impaction of the bronchus in such a patient may be mistaken for carcinoma. In the section on hypertrophic pulmonary osteoarthropathy, no mention is made of the remarkable relief of pain which frequently follows pneumonectomy or vagotomy, and the only theory of its ætiology discussed is that of the author, who regards it as a form of dyspituituarism. Despite a number of articles on the value of needle pleural biopsy, no mention is made of this technique; under the heading "Pleural Biopsy", the technique recommended is the making of an 8 cm. intercostal incision and the excision of an oblong section of parietal pleura measuring approximately 1·5 by 3 cm.

There is an extensive bibliography at the end of each chapter; but there are some notable omissions, such as Russell Brain's articles on neuropathy and Dew's on hydatids.

Despite these minor criticisms, the book can be recommended as a comprehensive survey of the subject and a useful compilation of modern knowledge of a disease which has increased alarmingly in recent years.

**Physical Diagnosis.** By F. Dennette Adams, M.D.; Fourteenth Edition; 1958. Baltimore: The Williams and Wilkins Company. 10" × 6", pp. 944, with many illustrations. Price: £6 12s.

CABOT'S "Physical Diagnosis" is a book well known to earlier generations of medical students, for it has been regarded as one of the outstanding works of its type since it was first published in 1900. Successive editions have naturally increased in size, and as the last two, published in 1942 and 1958, have been entirely the work of F. Dennette Adams, Cabot's name has justifiably been replaced. However, the book retains the general form established by Cabot and remains as a monument to this outstanding product of the Harvard Medical School and Massachusetts General Hospital.

In the 16 years since the previous edition, great advances have been made in medicine, and the author has freely drawn on the experience and advice of colleagues to ensure that the work embodies the best of modern medical practice. The section on electrocardiography has been completely revised, and greater attention has been given to diagnostic radiology. Nevertheless, the basic elements of physical examination are kept well to the fore, and the established diagnostic procedures are carefully explained.

Although the author stresses that the history is the key to diagnosis, one might venture the criticism that insufficient space is allotted to this important subject.

The text, which is clearly set out, is freely illustrated with well-selected photographs and diagrams, and one can thoroughly recommend the book as a medical student's vade-mecum.

**Textbook of Physiology and Biochemistry.** By George H. Bell, B.Sc., M.D., F.R.F.P.S.G., F.R.S.E., J. Norman Davidson, M.D., D.Sc., F.R.F.P.S.G., F.R.I.C., F.R.S.E., and Harold Scarborough, M.B., Ph.D., F.R.C.P.E., M.R.C.P.; Fourth Edition; 1959. Edinburgh and London: E. and S. Livingstone, Limited. 9¼" × 6¼", pp. 1080, with many illustrations. Price: 63s. (English).

THE first edition of this text-book appeared in 1950, to fill a need for an introduction to biochemistry and physiology primarily for the medical student. This is the fourth edition to be produced, an edition which has now appeared also in Spanish and in Italian. This alone is excellent proof of the real importance of this well-produced text in the training of the medical student.

In the present edition, published only two years after the third edition, the tendency to increase its size has been wisely resisted by the authors. A comprehensive introduction to physiology and medical biochemistry has been condensed to about 1000 pages, which include a great number of clear and instructive diagrams and illustrations, some in colour.

There are 55 chapters, which deal in logical sequence with the chemistry of the foodstuffs, enzymes and biological oxidations, energy exchange, digestion, intermediate metabolism, the blood, the circulation, respiration, body fluids and the kidney, special senses, the nervous system, the endocrine glands, cell division and heredity, growth and senility. Many of these chapters have been revised and rewritten. The restricted yet lucid presentation of such a vast accumulation of knowledge makes this book essential for the medical student in his pre-clinical years to grasp the essentials of bodily function.

A sound knowledge of the principles of physiology and of physiological biochemistry, especially as applied to the human being, can be obtained from this text-book, a knowledge which the student of clinical medicine must find of increasing importance as scientific and technological advances are more and more applied to the diagnosis and treatment of disease.

This book can be recommended, not only to the undergraduate, but to all graduates who wish to keep abreast of the broad advances in the physiological basis of medicine.

**Neoplastic Diseases at Various Sites.** General Editor, D. W. Smithers, M.D., F.R.C.P., F.F.R.; Volume 2. "Tumours of the Bladder", edited by David M. Wallace, O.B.E., M.S., F.R.C.S.; 1959. Edinburgh and London: E. and S. Livingstone, Limited. 9¼" × 6¼", pp. 368, with 202 illustrations and 25 tables. Price: 60s. (English).

DAVID WALLACE and his collaborators have produced a book for which there was a real need. They are well known for their special work in this field in London today.

The book is presented in seven sections dealing with mortality, industrial risk, ætiology, pathology, clinical assessment, surgical treatment and analysis of treatment. Case discusses the mortality from cancer of the bladder in different age groups and in different countries. Goldblatt outlines the biochemistry of bladder carcinogens in industry. Professor E. Boyland, also of the Chester Beatty Research Institute, explains why aromatic amines induce cancer in the bladder but not in other organs, and he has investigated certain naturally occurring carcinogens in man.

The pathological section, by Dukes, Pugh and Wallace, is unsurpassed. They use the excellent simplified histological grading and pathological staging as advocated by the Institute of Urology. Cooling's original post-mortem work correlates tumour behaviour with tumour types.

The clinical section on assessment and management is of greatest interest to the practising urologist. This section gives the clear and consise thinking of British urology, and illustrates the method of management as practised in some London hospitals. Our attention is rightly drawn to the dangers of radiotherapy, which has not displaced partial or total cystectomy. Harrison's section on the biochemistry of uretero-colic anastomosis is very well written, and concludes with a page on advice to patients. He points out that this important facet is sometimes neglected. The book concludes with a statistical review of the results of the treatment.

This is an excellent book of reference, written primarily for urologists; but, as the author remarks in his preface, it provides a fruitful field of study to statisticians, industrial or experimental organic chemists, pathologists, radiotherapists, physicians and surgeons.

## Books Received.

*[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]*

"The Clinical Evaluation of New Drugs", by Fourteen Authors; Edited by S. O. Waife, M.D., F.A.C.P., and Alvin P. Shapiro, M.D.; 1959. New York: A Hoeber-Harper Book. 9" × 6", pp. 234. Price: $7.00.

The book presents comprehensively the methods and standards by which new therapeutic agents can be properly evaluated.

"Heavy Metals and the Brain", by John N. Cumings, M.D., F.R.C.P.; 1959. Oxford: Blackwell Scientific Publications. 8¾" × 5½", pp. 172, with 9 tables and 4 illustrations. Price: 32s. 6d. (English).

The author is Professor of Chemical Pathology in the University of London.

The Medical Journal of Australia

SATURDAY, NOVEMBER 21, 1959.

## COMMUNICATING WITH THE PUBLIC.

THREE letters appear in our correspondence columns this week under the heading of "Medical Matters and the Press". The authors are well known Sydney surgeons, one being the immediate Past President of the Royal Australasian College of Surgeons. The letters highlight two matters: first, the unedifying character of certain publicity which has from time to time been given to medical individuals and institutions in articles in the lay Press, and second, the exaggerated and undesirable nature of certain sensational medical material which has been served up to the public. The letters are thoughtful and important, and with the strictures which they contain we must very largely agree. On the question of publicity given to institutions we hesitate to say much. For them good public relations and the inevitable attendant publicity are part of a continuous battle to ensure financial support, so perhaps the most that we can ask is that in this case publicity shall be dignified and restrained. Personal publicity for practising medical men is, on the other hand, rarely justifiable or ethical, and in its grosser forms it is illegal. Sometimes it is unavoidable, sometimes it can be sanctioned for special purposes or in special circumstances, as in news releases at medical congresses, but its deliberate pursuit is indefensible. It is difficult to be so explicit about the presentation of medical facts and stories for lay consumption. Sensationalism and exaggeration are of course to be highly deplored, but on the wider aspects of the subject it may be as well to pause and meditate a little.

Few people, if any, can be consistently objective about medical facts. Most medical students "develop" a series of terrifying diseases as they go through their courses, even doctors are notoriously bad at interpreting their own clinical symptoms and signs, and the layman can react in very strange ways in the face of medical ideas brought to him by newspapers, broadcasting, television and the like. For this reason, amongst others, many members of the medical profession are uneasy about passing on "popular medicine" to the people in the street. Some say bluntly: "The less they know, the better for everybody, especially themselves; so let's not talk about it." This is a sincere view, and we can well understand the thought that lies behind it, but the matter is not really so simple. The public, instructed or otherwise, never has been entirely happy to leave medicine to the doctor. People have every right to this attitude, but it brings its problems, and they are not diminished by doctors refusing to tell. A little medical knowledge may produce its crop of hypochondriacs, but complete ignorance of medical matters creates the vacuum only too readily filled by old wives' tales and the specious chatter of the patent medicine vendor. It may thus encourage the worst kind of self-medication. According to the old saying, "the physician who treats himself has a fool for a doctor". By extension, it may be said of all self-medicators that the less the knowledge, the greater the fool; and so for most people complete ignorance is no protection.

This is the position as it has always been, but the modern picture has its own striking characteristics. Medicine is no longer a mystery. People are interested in it, as they are interested in a lot of other things, and for the same reason—the absurdly logical reason that it is interesting, and grows more interesting every day. Fortunately this means that much of the interest is not introspective and is not necessarily harmful. But harmful or not, this interest requires satisfaction, and Press, publisher, broadcaster and television station are interested in satisfying it. In this regard it may be as well to quote "three of the facts of modern life" pointed out in a recent vigorous article by Harvey Flack:[1]

> 1. People can read, want to read, and will read.
>
> 2. Television is here to stay.
>
> 3. The man in the street, the ordinary patient, the man who reads newspapers, riffles magazines and looks a lot at the telly, takes his health for granted. He is deeply uninterested in health, in health education, and in preventive medicine. He is passionately interested in dramatic operations, death-dealing diseases, world-shaking epidemics, doctors who are heroes or villains, changes of sex, multiple births, and the conjoined twins of Kano.

This statement will not be palatable to many doctors, and especially to earnest and sincere people who are prepared to support health education while deploring public discussion of disease and its treatment. We can indeed all see the undesirable and morbid possibilities in the attitude described by Dr. Flack, but it is no good shutting our eyes to what he says. Perhaps he has made an overstatement, and people are more willing than he suggests to take reasonable doses of health education provided it is in an attractive form. Dr. Flack himself administers this particular medicament in quite large doses in the B.M.A. publication *Family Doctor*, of which he is the editor, and seemingly gets away with it if we may judge by the success that *Family Doctor* has achieved in Great Britain. Health education is certainly not to be despised or put aside, but we must at the same time accept the facts and do all that we can to see that what does reach the public about various other aspects of medicine is sound and in perspective.

There of course lies the practical problem, and we cannot pretend that it has been solved. It certainly will not be solved by wholesale condemnation of the lay Press, radio and television, as media for telling the

[1] *Med. Press.*, 1959, 241: 421 (May 13).

public about medicine and doctors, or on the other hand by abandoning our traditions of professional dignity and reticence. Somehow or other medicine and the various media of communication will have to learn to understand one another, to respect one another and to work together. This will not be easy. It will mean concessions on both sides. Perhaps it is an impossible ideal, at any rate as a consistent state of affairs, but it is still worth aiming at, and can unquestionably be achieved some of the time.

# Current Comment.

## GONORRHŒA.

GONORRHŒA is today one of the world's most widespread and most frequent communicable diseases. Figures before the WHO Expert Committee on Venereal Infections and Treponematoses, which met in Geneva recently, showed that, of 22 countries, the number of annually reported cases of gonorrhœa since 1950 had gone down in only four, had remained the same in two, and had risen in 16. The figures are incomplete, since there are probably three or four times as many unreported cases as reported ones, and self-treatment with penicillin is frequent.

The Committee strongly disapproved the casual use of penicillin in toothpaste and lozenges and the sale of penicillin across the counter without a doctor's prescription. Nor was the Committee in favour of the routine "shot" of penicillin for the seaman who comes back on board ship after an excursion on shore during which he may have exposed himself to venereal disease. The Committee made it clear that penicillin was still the queen of drugs in treating gonorrhœa and syphilis, and in mass campaigns against endemic treponematoses, including yaws, pinta and bejel, as well as endemic syphilis. However, its indiscriminate use was opposed because (i) the "shot" of penicillin given by a layman "on suspicion" might, by masking the symptoms of disease, prevent the doctor from making a proper diagnosis, (ii) too small a dose of penicillin might favour the development of resistant strains of organisms, and (iii) the unjustified use of penicillin might sensitize an individual to the drug, with the result that when penicillin was needed in earnest a serious reaction might occur. To sum up, the Committee's advice to the man in the street was: "Stay away from penicillin, and if in doubt, see a doctor."

In 1944, when penicillin was getting into its stride as the great new weapon against venereal diseases, it was believed that, if applied on a sufficiently wide scale, it would bring about the practical elimination of both syphilis and gonorrhœa from the list of afflictions that beset mankind. In many parts of the world, great success in syphilis control has been obtained, and a very considerable reduction in the number of new cases has now occurred. Again, striking results have been obtained with penicillin against endemic infections. In Bosnia, for example, endemic syphilis has been completely eradicated. But as concerns gonorrhœa, the drug has not lived up to expectations. Why? The WHO experts gave a number of reasons including the following: (*a*) belief in the efficacy of the "shot" of penicillin combined with widespread indifference (what may be called the "common cold attitude") in professional circles as well as among members of the public; (*b*) difficulty in diagnosing the disease, particularly in women, who may harbour the infection without showing any very marked symptoms; (*c*) the large number of cases and the general lack of immunity to gonorrhœa; (*d*) the fact that bigger doses of penicillin are needed for cure as resistant strains of gonococci are spread. The Committee recommended that the question of gonorrhœa, particularly its diagnosis and treatment, should be taken up internationally by creating a WHO gonococcus centre to collaborate with national laboratories throughout the world.

The Committee discussed at some length the common practice of giving treatment for venereal disease on board ships not carrying a doctor. It was agreed that treatment prescribed in port by a doctor should be continued and that treatment might be started on board should a member of the crew show signs of disease. In cases of probable gonorrhœa, penicillin should be given. If syphilis was suspected, however, treatment started should be limited to sulphonamides. Only if the voyage to the next port of call would take more than three weeks was penicillin treatment justified for a crew member showing possible signs of syphilis. The importance was stressed of obtaining a proper medical diagnosis in all cases.

In discussing the public attitude to venereal disease, the WHO experts emphasized the need for giving factual information on what should be treated as a medical rather than as a moral problem. It was stated that in both highly-developed and underdeveloped countries, word of mouth had shown itself to be so far the most effective method of informing the public. The need for giving information on venereal disease to schoolchildren was important, since, in a number of countries, the teenagers were becoming increasingly infected with venereal disease. The Committee endorsed the research plans of WHO and, among other projects, recommended especially field investigation into the transmission of yaws, work on methods by which treponemes could be cultivated in the laboratory, and the development of a vaccine against yaws.

## THE MEANING OF "PER CENT".

MEDICINE is to some a science, but the old taunt still contains a good deal of truth, that medical men are not, generally speaking, men of science (this term is used in its modern restricted sense), and this applies to many of those who commit their thoughts to paper. Even on highly technical subjects the critically minded may detect a surprising amount of inexactitude. An attempt to help people in this matter is the purpose of a special article by W. T. Caraway[1] reprinted in the "Year Book of Pathology and Clinical Pathology", 1958-1959 series. Caraway opens his article with the remark "The use of more explicit terminology would contribute substantially to the correct interpretation of experimental details", adding that this is especially true with reference to the choice of units for describing the concentrations of solutions. He then proceeds to a discussion of the terms employed, beginning with the much used and much abused "per cent". He points out that a "10 per cent solution of sodium chloride" means 10 parts of sodium chloride per 100 parts of something, and that there are three common ways of expressing the percentage composition of a solution. These are: (i) Weight per unit weight (w/w): a 10% (w/w) solution contains 10 grammes of solute dissolved in 90 grammes of solvent. (ii) Weight per unit volume (w/v): a 10% (w/v) solution contains 10 grammes of solute dissolved in a final volume of 100 ml. of solution. (iii) Volume per unit volume (v/v): a 10% solution (v/v) contains 10 ml. of solute dissolved in a final volume of 100 ml. of solution. This is very elementary, and most of us learnt, or should have learnt, this in our pre-clinical years but the distinction between these different types of percentage is often forgotten, and in some cases they can be important. We are pleased to note that Caraway then attacks the expression "milligrammes per cent", which is commonly understood to mean "milligrammes per 100 millilitres", but which in fact should mean "mg. per 100 mg. (w/w)" or "mg. per 100 microlitres (w/v)". If we wish to express ourselves accurately we should write, as Caraway strongly recommends, "mg. per 100 ml.". This discussion of "per cent" is only the first section of Caraway's paper, but we give it prominence because the misuse of this term is one of the commonest errors of

[1] *Amer. J. Clin. Path.*, 1958, 29: 493 (May).

slipshod scientific writing. Incidentally, our other *bête noire* of the percentage forest is the very common tendency to express subdivisions of small groups as percentages. For example, to say that the recovery of two out of seven represents a recovery rate of 28·5% is to pretend to a degree of accuracy which is completely misleading. Yet our contributors continually present us with tabulations of absurdly small numbers laboriously reduced to percentages.

The remainder of Caraway's article deals concisely with other traps for the unwary such as hydrates, molarity and normality, concentration of acids, saturated solutions and dilutions, and should be a useful source for aspiring authors and others who find themselves in difficulties over these matters. We intend to bear his article in mind for our own use when the occasion arises.

## VANCOMYCIN.

EVER since "Prontosil" was first introduced in 1935 there has been a steady procession of new specific antibacterial agents, and there is no indication of any falling off in the supply. After penicillin came streptomycin, then chloramphenicol and the tetracyclines. Newcomers of yesterday, like neomycin and erythromycin, already have an established place for use in the appropriate circumstances, and their place as the latest arrivals has been taken by newer agents, such as ristocetin ("Spontin"), kanamycin and vancomycin. These three are all broad-spectrum antibiotics with a powerful antistaphylococcal action, but their use is restricted by the fact that, for systemic action, they must be given by injection—in the case of ristocetin and vancomycin by intravenous injection. A number of reports on the use of ristocetin have appeared, including one in this Journal,[1] and we have recently reviewed a symposium on kanamycin.[2] Relatively little has yet been published about vancomycin, which is the subject of a recent report by the Council on Drugs of the American Medical Association.[3] In this it is stated that vancomycin is an antibiotic substance obtained from strains of *Streptomyces orientalis*, but that its structural formula has not been determined. It was introduced in 1958, and is highly active against Gram-positive cocci. It has proved valuable in the treatment of severe staphylococcal infections, and in some instances has been life-saving. The committee comments that it should be reserved for critically ill patients with infections produced by staphylococci which are resistant to the commonly used antibiotics; it suggests that it may be especially useful in dealing with antibiotic-resistant hospital strains. At the time of this report no instance of natural or acquired resistance to vancomycin had been recorded. The committee notes that the indiscriminate use of vancomycin is largely discouraged by the fact that it must be administered intravenously. Good results have also been obtained with the use of vancomycin in cases of subacute bacterial endocarditis due to penicillin-resistant strains of alpha streptococci. The toxicity of vancomycin is stated to be low in short-term therapy, though auditory impairment has been noted when therapy has been prolonged or the doses employed have been unusually large. Its metabolic fate and distribution are not known, but it is excreted in the urine; therefore it is suggested that this drug should be used with caution in patients who suffer from impaired renal function.

The usual dose is two grammes in 24 hours, which is generally administered in amounts of 500 mg. every six hours. Concentrated solutions of 500 mg. in 10 ml. of water can be given slowly by direct intravenous injection, but vancomycin is very irritating and may cause pain in the injected vein or chemical thrombophlebitis, so it is preferable to give it well diluted in an intravenous drip infusion of normal saline or 5% dextrose in water. The obvious comparison is with ristocetin; the latter has been reported to cause severe leucopenia if therapy is prolonged, but much more work must be done before it will be possible to say which of these two powerful anti-staphylococcal agents is likely to prove the more useful.

[1] MED. J. AUST., 1959, 2: 151 (August 1).
[2] MED. J. AUST., 1959, 2: 570 (October 17).
[3] *J. Amer. med. Ass.*, 1959, 170: 810 (June 13).

## GEOGRAPHICAL PATHOLOGY.

THE publication of a recent report of a study group on geographical pathology[1] is evidence of an increasing interest in the geographical incidence of disease. Earlier work in this field tended to be concerned with infective disease and the avitaminoses; but many other types of diseases can be studied by the methods of epidemiology and statistics. The members of the study group believe that geographical pathology is really another name for epidemiology, if this latter term is not defined narrowly to be the study of infectious disease. They then point to some weaknesses in the methods of international comparisons, especially when mortality, autopsy, and hospital clinical or morbidity statistics are compared. They describe different types of morbidity surveys, with the techniques and organization appropriate, and registration systems. They find that registration systems are especially useful for such conditions as peptic ulcer and cancer.

We may comment on some of their findings. Rheumatoid arthritis varies considerably from country to country; for example, it is rare in Japan. Hypertension is another disease with marked variations in incidence between countries. Atherosclerosis and coronary thrombosis are now the leading causes of death in many countries, and many observations are being made on different population groups. Some of these studies, which compare the experience of essentially similar stocks under different geographical conditions, may yield information of great importance; for example, the Japanese on Hawaii can be compared with those living in Japan under different social and dietary conditions. Useful information on chronic bronchitis and diabetes has been obtained; but perhaps the greatest use of the methods has been in the study of the cancers. Many cancers have a well-marked geographical incidence, and The Council for International Organizations of Medical Sciences has had two congresses, one devoted to lung cancer and one to cancers generally. Non-controversial instances may be cited — the cancers of chimney sweeps, the skin cancers, cancer of the liver in certain malnourished populations, cancer of the stomach, the Schneeburg cancers of the lung, and many others. In fact, geographical pathology gives us hope that many cancers, more than we now recognize, are preventible.

It may be concluded that geographical pathology, or a broadened form of epidemiology, has produced many valuable observations on disease in the past, and that its value has been greater than might have been expected after a discussion of the limitations of the methods. Much also can be expected from such methods in the future.

[1] "Methods of Geographical Pathology". Report of the Study Group convened by The Council for International Organizations of Medical Sciences, established under the joint auspices of UNESCO and WHO; edited by Richard Doll; 1959. Oxford: Blackwell Scientific Publications. 8¾" × 5¼", pp. 72. Price: 9s. 6d. (English).

## HALF-YEARLY INDEX TO "THE MEDICAL JOURNAL OF AUSTRALIA".

THE index to THE MEDICAL JOURNAL OF AUSTRALIA for the half-year ended June 30, 1959, is now available. A copy of the index is sent to all libraries, medical societies and associations receiving THE MEDICAL JOURNAL OF AUSTRALIA, as well as to journals having exchange arrangements with the Journal. Readers who have previously asked to have their names placed on the index mailing list will receive their copies as usual. Other readers who wish to receive a copy are invited to write to the Manager, The Printing House, Seamer Street, Glebe, New South Wales.

# Abstracts from Medical Literature.

## OBSTETRICS AND GYNÆCOLOGY.

### The Elderly Primipara.

R. J. LEGERSKI (*Canad. med. Ass. J.*, May 29, 1959) reviews the confinements of elderly primiparæ in a series of 20,000 infants delivered during the years 1954 to 1957. There were in all 124 cases, the maternal mortality rate was zero, and the fœtal perinatal mortality rate 32·2 per thousand. In 30 cases the pregnancy resulted in a normal vertex delivery, in 57 the patient had a low or mid forceps delivery, there were two breech deliveries, in 12 cases rotation by forceps or hand was necessary, and 23 of the women were delivered by Cæsarean section. In the spontaneous deliveries the length of labour averaged 10 hours, and in the deliveries with an occipito-posterior or occipito-transverse position the average was 21·7 hours; the length of labour in cases ending in forceps delivery averaged 17·1 hours. The Cæsarean section rate for patients in all age groups was 2·1% in this four-year period, whereas the Cæsarean section rate for elderly primiparæ was 20·1%. The elderly primiparæ aged 40 years or over had a Cæsarean section rate of 35·7%. The most common indications for section in order of frequency were toxæmia, myoma, breech presentation and cephalo-pelvic disproportion. In the group aged 35 to 39 years, approximately one-third had subsequent deliveries, and in the group aged 40 years and over 22% had subsequent deliveries.

### Spasm of Round Ligaments.

O. GLASSMAN (*N.Y. St J. Med.*, April 15, 1959) states that pain in the region of the round ligaments is a frequent occurrence during pregnancy, but is usually mild and is frequently mistaken for gas pains or pressure. If severe, it can be confused with appendicitis, threatened abortion, premature labour, renal colic or twisted ovarian cyst. The author states that this syndrome is not mentioned in modern text books, but has been described in several articles on pain during pregnancy, and was mentioned 100 years ago by W. F. Montgomery. In a series of 100 consecutive private patients, 30 made an unsolicited complaint of pain diagnosed as arising in one or both round ligaments. This pain may be first noticed in either the first, second or third trimesters, and is more frequent during first and second pregnancies. Five case histories are given to illustrate possible errors in differential diagnosis, and the author comments that recognition of this syndrome will allay a great deal of anxiety on the part of both patient and physician, and may eliminate unnecessary bed rest, hospitalization or even laparotomy.

### Oxytocin Aerosol in Labour.

A. NOTTER (*Presse méd.*, August 8, 1959) has investigated the use of oxytocin given as an aerosol in compressed air in labour. The dose was 10 to 15 units, administered over a period of 15 minutes. In six primiparæ and 14 multiparæ with minor degrees of uterine inertia, 80% of positive results were obtained. No ill effects on mother or baby were noted. The author considers that positive results would be more consistently obtained by improvement in the apparatus, which must be capable of producing an aerosol with particles of uniform diameter, and less than 0·05μ. He believes that technical improvements in the aerosol would extend the clinical indications of the method—for example, in inducing labour, in association with intermittent administration of oxygen, and especially with the correction of anomalies of cervical dilatation. It may complement psycho-physical methods of confinement if the results of these trials are confirmed.

### Radiological Diagnosis of Tubal Pregnancy.

R. MUSSET, A. NETTER AND A. DUPAY (*Presse méd.*, June 6, 1959) describe the technique of hysterosalpingography with diodone polyvidone, and the radiological appearances of various types of tubal pregnancy. They state that the method is indicated only when biological tests for pregnancy give negative results, and that it is a diagnostic procedure of great value and complete safety in tubal pregnancy. Pregnancies in the ampullas are the most clearly visualized, occasionally presenting a pathognomonic radiological appearance at first glance. Infundibular pregnancies, on the other hand, may not be clearly shown. The authors state that they have observed only one case of interstitial pregnancy, and that they are unable to describe the appearances in that condition.

### Amenorrhœa and Chronic Liver Disease.

P. GREEN AND L. RUBIN (*Amer. J. Obstet. Gynec.*, July, 1959) report 18 cases of amenorrhœa associated with chronic liver disease. Oligomenorrhœa or amenorrhœa has been noted by several observers as a manifestation of acute and chronic liver disease; in the authors' cases the ætiological factors concerned were varied and included infectious hepatitis, alcoholic cirrhosis and lupoid hepatitis. In all of the cases reported, flocculation screening tests for the presence of liver disease gave strongly positive results, so that even in the few cases where liver disease was not obvious, if suspicion had been awakened, these tests would have strongly suggested the probable role of liver disease in the production of amenorrhœa. The reason why amenorrhœa develops in patients with chronic liver disease is not clear.

### The Spontaneous Motility of Human Uterine Muscle.

E. L. COREY, H. S. MCGAUGHEY AND W. N. THORNTON (*Amer. J. Obstet. Gynec.*, July, 1959) present a series of studies on human myometrial strips excised from both gravid and non-gravid uteri. Two factors were determined: (i) the frequency of contractions in the excised muscle, and (ii) the magnitude of contraction (degree of muscle shortening). In the non-gravid uterus spontaneous activity was recorded from 115 of the 119 samples, excised from women 27 to 77 years of age. The frequency of contraction averaged 0·49 per minute with an average height of contraction of 20·5 mm. With increased age the capacity of human uterine muscle for spontaneous shortening was decreased and the contraction waves were relatively rapid and feeble. Muscle from uteri with secretory endometrium exhibited a slower rate of spontaneous motility than did those from uteri in the proliferative phase. However, the ovarian cycle had no influence over muscle shortening. Repeated pregnancies and labours, the presence of fibroids elsewhere in the uterus, sedatives, analgesics and anæsthetic agents administered at the time of operation, as well as race, were found to be of no statistical significance. Muscle samples from gravid uteri (from two months to term) showed no statistical difference in relation to motility, when compared with the tissues from non-gravid uteri.

### Antimicrobial Treatment of Tuberculous Salpingitis.

G. SCHAEFER (*Amer. J. Obstet. Gynec.*, May, 1959) reviews cases of treatment of tuberculous salpingitis with combined therapy by streptomycin, PAS and isoniazid, or streptomycin and isoniazid. Short term therapy does not cure tuberculous salpingitis. Long term therapy has not been used in sufficient numbers of advanced cases to determine whether it will effect a cure. In cases of minimal infection long-term therapy over periods of from 10 months to three years has apparently resulted in healing of the tuberculous lesions, but operation was performed if such patients showed signs and symptoms of recurrent disease. Although a few pregnancies have been reported following a diagnosis of tuberculous endometritis, most of these have terminated in abortion, ectopic pregnancy or premature delivery. The gross pathological changes in the Fallopian tubes leave little hope for the occurrence of a normal intrauterine pregnancy. In the rare cases in which pregnancy does occur, there is a four-to-one chance that a tubal pregnancy or an abortion will result. The author believes that operation is indicated in all patients with advanced pelvic tuberculosis, after a three or four months' course of combined antimicrobial therapy. In patients with minimal disease antimicrobial therapy is advised for two years or longer. These latter patients should be kept under constant watch after therapy is discontinued. There appears to be no valid reason for operating on a patient known to have genital tuberculosis, without a pre-operative course of anti-tuberculosis drugs. Post-operatively, therapy should be given for approximately one year.

### Habitual Abortion.

E. C. MANN (*Amer. J. Obstet. Gynec.*, April, 1959) presents a report on habitual abortion from a study of 160 patients. The patients were classified as habitual aborters if they had had three or more spontaneous abortions. Each patient upon admission to the author's clinic undergoes a thorough gynæcological examination, which includes hysterography and intrauterine balloon studies. In the absence of a discernible abnormality, the patient is seen in a series of pre-conceptional psychiatric interviews. Of the 160 cases studied, two were found to have bicornuate uteri for which unification procedures were performed,

13 were found to have an incompetent internal cervical os, and the remaining 145 were studied psychosomatically. In this latter group, 91% of all pregnancies before treatment ended in abortion, and with treatment 19% ended in abortion. In the course of this exploratory psychiatric investigation of habitual abortion definite psychological patterns emerged which point to a relationship between emotional factors and the abortion habit. The author presents a new method of evaluating the competency of the internal os and isthmus of the uterus by using an intrauterine "Latex" balloon. Of 10 patients who for investigative reasons were not offered surgery, but instead were followed through a pregnancy after a diagnosis of cervical incompetence had been made, eight aborted between the sixteenth and the twenty-eighth weeks and the other two patients aborted in the first trimester.

### The Repair of Ureteral Injuries.

W. E. BROWN AND C. G. SUTHERLAND (*Amer. J. Obstet. Gynec.*, April, 1959) review their experimental studies and clinical results in the repair of injuries to the ureter. Ætiologically there are three types of injury: (i) surgical accidents caused by distorted anatomy or difficult surgery; (ii) deliberate injuries made during the course of surgical dissection, mainly occurring in the treatment of malignant conditions of the pelvis; (iii) ischæmic injuries resulting from the combined effects of surgery, radiation and/or infection on the blood supply of the ureter, with consequent necrosis. They observed that antibiotics, antifibrotics and mucosa-to-mucosa anastomosis would not prevent inflammatory tissue reaction to suture material, or infection with subsequent stricture. A suture closure of the ureter was not necessary from the point of view of healing, leakage or extravasation, and polyethylene was found to be biologically inert. The repair of ureteric injuries is favourably influenced by loose approximation with a minimum number of sutures over polyethylene catheter splints left in position for three to four weeks. Uretero-ureteral anastomosis and ureterocystostomy provide the best results for minor defects in the terminal part of the ureter. Bladder tube grafts are preferable for major defects in the terminal part of the ureter.

### Stein-Leventhal Syndrome.

W. M. ALLEN AND R. B. WOOLF (*Amer. J. Obstet. Gynec.*, April, 1959) consider that the ovaries of patients with the Stein-Leventhal syndrome produce too much androgen. Clinically, these ovaries look like over-sized testicles, and when an incision is made through the cortex of the ovary the medullary portion is much larger than in the normal ovary. Embryologically the medulla is the remnant of the testicular portion of the indifferent gonad and could have an androgenic function. The authors treated 22 patients by medullary resection of the polycystic ovary. In all cases a normal menstrual period occurred between 15 and 45 days after the operation, and in most cases regular cycles of normal periods were maintained. Little real regression of virilism was shown, and of the 12 married women who wished to have children, three had been delivered of four normal children and another one was in the seventh month of pregnancy. There were two early abortions and one premature stillbirth at five and a half months. Histologically, the ovarian microscopic findings were in accordance with those ascribed in the literature to the Stein-Leventhal syndrome. The authors state that their technique does not sacrifice large portions of ovarian cortex with its important complement of primordial follicles.

## ANÆSTHETICS.

### Dihydro-hydroxycodeinone Pectinate.

R. H. BOYD (*Anæsthesia*, April, 1959) reports the result of a trial undertaken to assess the efficiency of dihydro-hydroxycodeinone pectinate ("Proladone") as a premedicant and as a post-operative analgesic. Observations were made on 297 patients, subjected to a wide variety of surgical procedures. In 47 cases "Proladone" was used for premedication in a dosage of 10 mg. given intramuscularly with 50 mg. chlorpromazine and one one-hundredth of a grain of atropine, given one hour before operation, in place of the usual "Omnopon" with scopolamine or morphine with atropine. In 250 cases "Proladone" was given as a post-operative analgesic, the ages of the patients ranging from six to 90 years. The dosage in the latter series was 10 mg. given intramuscularly in 90% of cases; some patients more solidly built than the rest received 20 mg., and children under 10 years of age were given 5 mg. No patient was given more than three doses, and the maximum benefit was obtained from injections given 30 minutes before the end of the operation, when the full effect was apparent by the time the patient regained consciousness. The author concludes that "Proladone" has definite analgesic properties and a prolonged action; side effects are minimal and there is a wide margin of safety; the hypnotic effect is only mild, and no clinical evidence of respiratory depression was noted with the dose used. As premedication, in combination with chlorpromazine and atropine, it was considered unsatisfactory in that it failed to produce an adequate tranquillizing effect. When it was given as a post-operative analgesic, more than 97% of the patients in the trial were sufficiently relieved of pain to allow sleep.

### A New Short-Acting Thiobarbiturate.

M. E. PEEL *et alii* (*Nature*, May 23, 1959), of the Research Division of Allen and Hanburys, Limited, describe briefly the development of, and preliminary trials with, a new short-acting thiobarbiturate, which they refer to as B.137. They state that in 1955 thiopentone was employed in over 80% of all anæsthetics given in Great Britain, but that the length of time which may elapse between recovery of consciousness and complete return to normal of the patient's mental faculties is in some circumstances a disadvantage. Search was therefore made for an intravenously administered anæsthetic agent from which recovery would be more rapid. A series of 1:5:5-trialkyl thiobarbituric acids were therefore prepared and their effects studied pharmacologically first on mice and then on rabbits. Three compounds were obtained which appeared sufficiently promising for trial in man; two of these were soon eliminated because of undesirable side-effects, but B.137 passed the preliminary trials satisfactorily. In a series of 71 patients receiving identical doses of either B.137 or thiopentone, no variation was observed in reactions or in the length of the induction period, and surgical anæsthesia was equally satisfactory with both drugs. However, the time of recovery after administration of B.137 was approximately half that required after thiopentone. The authors state that, like thiopentone, B.137 is best administered as its sodium salt, and is presented as a sterile mixture of this salt with a suitable buffer. They state that the chemistry and pharmacology of the new drug will be described in further detail elsewhere, and that wider clinical investigations are now in progress.

## SURGERY.

### Strangulated Femoral Hernia.

F. A. ROGERS (*Ann. Surg.*, January, 1959) reports on 170 cases of strangulated femoral hernia treated at the College of Medical Evangelists Surgery Service at the Los Angeles County Hospital. In this series there were 116 females and 54 males, and 71% of the patients were aged 60 to 90 years. The mortality was found to be adversely affected by advancing years, male sex, a right-sided lesion, other associated diseases, electrolyte imbalance, prolonged operating time, the presence of small bowel in the sac, and strangulation requiring bowel resection. The over-all death rate was 13% to 20% in males, but only 10% in females. In 35 cases requiring resection of gangrenous small bowel there were nine deaths. In this series 105 patients stated that they were previously aware of hernia, and there were 12 deaths in this group. An elective repair of all femoral hernias is advised.

### The Surgical Management of Tic Douloureux.

E. S. GURDJIAN, J. E. WEBSTER AND D. W. LINDNER (*Surgery*, February, 1959) present the results of 25 years' experience in the surgical management of tic douloureux, involving 348 patients, on whom 391 operations were performed. They give statistics regarding age and sex incidence, distribution of pain and numbers and types of surgical procedures used. They discuss the surgical management, results and operative morbidity and mortality. In general, although conservative treatment may be used in early cases, ultimately surgical treatment becomes necessary. They found that decompression of the sensory root was a satisfactory first step in the management of 83% of their patients. Those experiencing a recurrence of the pain are then treated by subtotal section of the sensory root. The authors therefore state that in most patients now the pain is not exchanged for a numb face.

# Congresses.

## THE AUSTRALIAN AND NEW ZEALAND ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE thirty-fourth meeting of the Australian and New Zealand Association for the Advancement of Science was held in Perth from August 24 to 28, 1959, under the presidency of H. C. COOMBS, M.A., Ph.D., LL.D.

### The Sections.

The Sections represented were: A, Astronomy, Mathematics and Physics (including Optometry); B, Chemistry; C, Geology; D, Zoology; E, History and Political Science; F, Anthropology; G, Economics, Statistics and Social Science; H, Engineering and Architecture; I, Microbiology, Epidemiology and Preventive Medicine; J, Education, Psychology and Philosophy; K, Agriculture and Forestry; L, Veterinary Science; M, Botany; N, Physiology, Biochemistry and Nutrition; O, Pharmaceutical Science; P, Geography.

### Council Meeting.

The Congress began with a Council meeting at the University of Western Australia on August 24. A delegate of the Federal Council of the British Medical Association in Australia attended. It was announced that there were 800 Fellows and members, and that approximately 2000 would attend the Congress. The President, Dr. H. C. Coombs, nominated Sir Samuel Wadham as the next President to the General Committee. The next Congress will be held in Brisbane in May, 1961.

### Public Lectures.

During the Congress, five evening lectures open to the public were given. A series of lectures in the afternoon and late afternoon to school students of leaving and subleaving standard was arranged in conjunction with the Adult Education Board. These lectures were so successful that they were repeated in the following week. Some of the titles were: "What is Astronomy?"; "How to Find Oil"; "The Aborigines and Ourselves"; "How to Survive a Drought"; "The I.G.Y.".

### Presidential Address.

The presidential address was delivered on Wednesday, August 26, in the Winthrop Hall, and was well attended. Dr. Coombs's address was an erudite survey of the economic situation in Australia. The fact of a continued rise in prices during a period of recession was analysed, and three suggestions were made for consideration. The conception of a development tax for expanding industry and public works was interesting, since in theory no tax would be payable if each taxpayer had saved his moiety during the year. It is hoped that the text of Dr. Coombs's address will be available throughout Australia.

### Sessions of Medical Interest.

For the first time, medical education was a subject in Section I, of which the president was Dr. I. J. Wood, of Melbourne.

Sir Charles Hercus, of the University of Otago, introduced the discussion with a paper entitled "The Teaching of Medicine and its Place within the University". He considered that the present trend to have the faculty of medicine within the university was a wise move away from clinical schools in large hospitals. Sir Charles Hercus referred to the agreement of the General Medical Council to allow a more flexible curriculum, so that the aim was to produce at graduation men with trained minds, instead of merely efficient general practitioners.

Professor E. S. J. King, of the University of Melbourne, read a paper entitled "The Correlated Teaching of Pathology", in which he dealt with the problem of teaching pathology either as a "block" subject or as a fully integrated subject. He favoured a compromise.

On August 27, the subject of staphylococcal infections within hospitals was discussed by five speakers. Dr. R. T. B. Green, of the Royal Perth Hospital, read a paper entitled "Reservoirs of Staphylococci in a General Hospital"; it appears that urine carries many types of staphylococci. Dr. Green pointed out that the average age of the patients in his series was 53 years, which meant that they were in an age group susceptible to cross infection. Dr. K. F. Anderson, of the Institute of Medical and Veterinary Science, Adelaide, read a paper entitled "The Staphylococcus in the Hospital and the Home; Some Attempts at Control". His paper dealt with ways of dealing with staphylococcal infection in families following the return of a member from hospital. Dr. V. D. Plueckhahn, of the Geelong and District Hospital, read a paper entitled "The Staphylococcus and the New-Born Child", dealing with the measures taken to diminish the incidence of infection in a maternity hospital. The other two papers in the symposium were as follows: "Reduction of the Staphylococcal Infection in the Newly Born", by A. M. Hill, Hildred M. Butler and J. C. Laver, of the Royal Women's Hospital, Melbourne; "Hospital Blankets and their Sterilization", by T. A. Pressley, of the Wool Research Laboratories, Commonwealth Scientific and Industrial Research Organization, Melbourne.

On August 28, Section I discussed public health.

The first paper was presented by Dr. W. Laurie, the Director of the Public Health Laboratory in Perth, who discussed "Public Health Laboratories in Western Australia". He traced the establishment of pathological services in England and Wales, and mentioned that a population of 1,000,000 supported a regional laboratory. He said that such laboratories were expensive to furnish and to staff correctly. Dr. Laurie then discussed the scattered population in Western Australia and the need for the "under-privileged" to have access to laboratory services. The proposal was made to set up laboratories staffed by technicians in various parts of Western Australia.

In the discussion on Dr. Laurie's paper, Sir Charles Hercus said that New Zealand had commenced in that way, and had finished with trained pathologists in the district laboratories.

Professor W. B. Macdonald, of the University of Western Australia, read a paper entitled "The Changing Function of Child Health Services". He said that gastroenteritis was the very least of the causes of death of children in Western Australia, and emphasized that the functions of infant health nurses needed reorientation.

# British Medical Association.

## SOUTH AUSTRALIAN BRANCH: SCIENTIFIC.

A MEETING of the South Australian Branch of the British Medical Association was held on February 26, 1959. The meeting took the form of a symposium on industrial medicine.

### An Industrial Medical Plan.

MR. A. G. GIBBS read a paper entitled "Some General Comments on the Introduction of an Industrial Medical Plan" (see page 753).

DR. J. L. STOKES read a paper entitled "Medical Aspects of an Industrial Medical Plan" (see page 752).

DR. DAVID CRAVEN, in opening the discussion, said that the previous speakers had shown how an industrial health plan had been established, and had demonstrated its usefulness at General Motors-Holden's. However, the question was, what about the dozens of small and middle-size manufacturers who had industrial problems and industrial accidents? In dealing with industrial medicine—or occupational health, as fashion decreed the subject be called at the moment—there were (i) the workers and unions, (ii) management and their insurers, (iii) the medical practitioners. The views of those three were not always in agreement, but he thought that their two main concerns were (a) the welfare of the employee and (b) pounds, shillings and pence. He hoped that the former was the vital factor with all three. Doctors must ask themselves whether they were satisfying the management and themselves. If the worker was not satisfied with his treatment he might change his doctor; if he was not satisfied with his financial remuneration, then he could see his union representative or lawyer. If doctors were not satisfied, then they could get other advice from specialists, rehabilitation insurance companies and assessors, the British Medical Association, etc. If the management was not satisfied, it would arrange some other method of looking after its employees. That was the point he wished to discuss, and he thought that it was where Dr. Stokes could help.

Dr. Craven then posed the question whether managements and insurance companies were satisfied with the service that doctors were giving them at present. He suggested

that they were not completely so. What could doctors do? If they did not do something, what would the management do? Alternatively, what could the doctors and management do together? Dr. Craven then proposed a tentative plan, in four sections.

1. Doctors dealing with industrial injuries must be readily available. That applied equally to the specialist and the general practitioner. They must consider the management as well as the patient—e.g., the employer was entitled to know what was going on. General practitioners must be willing to refer to consultants readily any problem which was or was likely to be outside their scope of experience, or in which difficulty was likely to arise—such as the person of inadequate personality with a relatively minor physical injury giving rise to disproportionate absence from work. The specialist should not expect to see every industrial patient, for the majority of injuries did not require his special skill. The specialist should refer back to the general practitioners patients who required only further routine treatment. Public hospitals should refer patients to private doctors as soon as possible. That was a plea for a team spirit, and if doctors acted as a team there could be no complaint about the quality of the medical service the patient received.

2. The management must cooperate with the doctor. Dr. Craven said that, much as he disliked suggesting more paper work, he thought that a letter accompanying each patient (except in grave emergencies) would be of great help. In that way the doctor would know more of the type of injury suffered, and whether it was a genuine industrial one. Also, it would give the doctor a personal contact with the company should that be required.

3. Some effort was urgently needed regarding rehabilitation. They knew of the excellent work of the rehabilitation centre; but surely it should be possible to finance and staff a private centre with all the advantages of more personal contact. That was a problem of many facets. In such a centre there would have to be minimum delay in having the patient accepted. His particular disability would be studied, and every attempt would be made to remedy it. The type of work done must have some purpose in it, for a good rehabilitation centre could be a colossal morale builder. Medicine and engineering must work hand in hand. Other problems, which he would not amplify, were early re-employment, treatment while working, etc.

4. A panel should be formed of interested doctors, who would be available to visit factories to give advice on industrial safety and occupational health. Dr. Craven said that he had thought no such service existed in South Australia until the President informed him that there was a Government department available for consultation. He wondered whether it would be possible for a private organization to be formed. Most industrial medical officers overseas considered that less than 25% of their time was taken up in actually treating injured and sick, and 75% was used in an advisory capacity. Most of them gave 0% of their time in this way. Management had discovered that the intelligent opinion from outside could be of great assistance in finding loopholes in safety procedure during the installation of new plant, etc. The doctor could help the engineer.

Dr. Craven, in conclusion, asked Dr. Stokes whether he thought such a plan was possible, or whether too many individuals were involved for it to be workable. He also asked Dr. Stokes whether, with his experience of becoming a doctor in a factory, he thought a management-medical coordination could occur largely to the exclusion of the insurers, and whether the management would agree to pay the bill.

# Medical Societies.

## PÆDIATRIC SOCIETY OF VICTORIA.

A MEETING of the Pædiatric Society of Victoria was held at the Royal Children's Hospital, Melbourne, on April 8, 1959.

### The Diagnosis of Hirschsprung's Disease.

PROFESSOR O. SWENSON said that many people had asked him what had first interested him in Hirschsprung's disease. The explanation was simple. In the Boston medical schools young men were not left to tarry, and whilst it was unexpressed, there was a policy of "publish or perish". Young men were thus immediately put to work, and thus he had found himself with a group of patients with congenital megacolon. There were not many of them, but they were so much trouble that they seemed very numerous. Quite fortuitously he had come across three children with evidence of advanced megacolon who developed all the signs of acute mechanical obstruction. The only thing to do was to establish a colostomy, and with that the children recovered perfectly well. He had been most impressed by how magnificently those children had been decompressed—it was just as if a balloon has been pricked. At the time he had been very interested in motility studies. He had therefore placed balloons proximal to the colostomies and observed normal colonic motility. That had not seemed right at all, because everyone had thought that the bowel was fundamentally diseased. Yet repeated observations of motility and tests with various drugs showed the colon to respond as if it was normal. The three children who were the object of those studies remained perfectly well, gained weight and became active normal young citizens; but the problem of the colostomy remained. The question therefore arose, how could those children be managed so that the colostomy would be eliminiated? There had been much consultation about that problem, and finally Dr. Janeway (the present professor of pædiatrics at Harvard University) had suggested that the colostomies be closed and the patients treated medically. That had been done, and all had been well for some months; but gradually trouble had recurred, and within six months all three had had to have their colostomies reopened.

It had seemed to Professor Swenson that the only explanation for that behaviour was that there was an area of dysfunction distal to the colostomy, whose nature was not then known. It was certainly not a pure mechanical obstruction, as there had been plenty of opportunities in the operating room and at the post-mortem table to observe it, had it been present. So it had seemed that the only explanation that could be offered was that there was an area of dysfunction distal to the colostomy. The lesion was often just in the distal part of the sigmoid colon, and often the pathologist would see it only at the operating table and consider that it was essentially normal colon. The proximal dilated area had in the past been considered to be grossly abnormal, and had therefore been resected. The new idea was that the area that was perfectly innocent in gross appearance was probably the seat of a malfunction. It was known that it was aganglionic, but that did not provide evidence of dysfunction. However, decompressing those children with a colostomy permitted the bowel to return to an essentially normal appearance. That observation had added to the feeling that there was some functional obstruction. Motility tracings of the colon in the patients with colostomies had shown that the trouble was probably on the left side; but those studies had also shown that the colon was very capricious, with long periods of inactivity. Thus, recording from one position would be misleading. Therefore three recording points had been used—in the splenic flexure, in the descending colon and in the recto-sigmoid. It had been found that in a rough way peristaltic activity carried down from one segment to another. Strangely enough, very little work had previously been done on normal tracings from the colon, so that they had had to do a series of control tracings. Those had been obtained from patients who had had a right colectomy for some reason and had been left with a colostomy and an intact left colon. In the patient with congenital megacolon, peristalsis in the dilated segment was hyperactive. However, those powerful waves never entered the recto-sigmoid. From those observations it was concluded that the basic physiological derangement was a defect in peristalsis in the distal segment, and that the dilatation in the area proximal to that was secondary. It had also been suspected that there was a higher intraluminal pressure in the distal segment. However, it was very difficult to measure intraluminal pressure, unless one made a reading of intraperitoneal pressure and thus determined that what one was recording from the lumen was actually due to spasm of the segment, and that it was not contributed to by the intraperitoneal pressure. Professor Swenson said that no statement could be made on that point, although in his opinion the intraluminal pressure in the aganglionic segment was in fact higher. So it had then been proposed that the distal segment should be resected—since that was the area which was defective in peristalsis and aganglionic—rather than that the dilated segment should be resected, which was what had previously been done. An operation to do that had then been worked out and applied.

Professor Swenson went on to say that many people had wondered how that distal lesion had been overlooked for so many years, since radiographic examination had

been a common tool in the diagnosis of megacolon. The explanation was probably that the radiologist knew that he was examining a patient with megacolon, and had therefore merely filled up the massive dilated segment with barium, and because there was usually a large loop that fell into the pelvis, it obscured the detailed architecture of the distal part of the colon, particularly the recto-sigmoid and rectum. However, by simply turning some of those patients into the lateral position, one could see the peculiar narrow segment. Dr. Newhauser had made that observation, but had never published it as his own original observation, because, being a very fair and reasonable man, he had found, on going over some old records, that his predecessor had described it on a couple of occasions. When Dr. Newhauser developed the simple technique of using a small amount of barium, the lesion was easily demonstrable. In most of the patients in the older age group with aganglionic megacolon, the radiological appearance was pathognomonic. However, it had been thought that the diagnosis might have been missed in some patients who had variations of the typical configuration. Professor Swenson said that consequently it had occurred to him that he might take a biopsy of the rectal wall and make an appraisal of the sandwich area between the circular and longitudinal fibres, and thus have a method of diagnosing Hirschsprung's disease by biopsy. At first he had been discouraged by his senior colleagues, who had said that the procedure would lead to numerous complications; that had caused some delay. However, eventually it had been tried in the post-mortem room, and it had been found to be a very simple matter to secure biopsy material that invariably contained ganglion cells. Biopsy specimens were then secured from patients. The technique had proved to be useful in various situations—for example, in the case of the child whose constipation was so severe that one wondered if a very short aganglionic segment was being overlooked. It was also useful in diagnosing those cases in which a transverse colostomy had been established without any diagnostic barium studies having been made. Those colostomies had usually been established when the patients were very young infants, and when some years later the question cropped up whether they were really suffering from congenital megacolon, it was impossible to answer it by a barium enema X-ray examination. About 150 biopsies had since been done. The idea of only doing a mucosal biopsy had been toyed with, but it had been decided that it required almost as much of a procedure as to take out part of the muscular wall, and those with experience of the pathology knew that the ganglion cells in the submucosa were extremely difficult to identify and that one could at times not be absolutely sure of their presence, even after a considerable period of study. It had been thought that if the test was to be of any value in any beyond a few very specialized centres, the muscular coats would have to be included and thus give the average pathologist the chance to make the diagnosis. In practice the test had worked out very well. Surprisingly, where the test had become most useful was in the newborn. People were just gradually becoming aware of the fact that Hirschsprung's disease in the newborn was an entirely different entity from that in the older child. Recently the records had been reviewed of 64 infants aged under one year, to whose early history good access had been possible, and in 73% their symptoms and signs were identical with those of mechanical obstruction. A mistake had been made in failing to distinguish those newborn infants from patients with mechanical obstruction, and consequently in his and his colleagues' own series of some 200 patients, 15% had a history of having been subjected to operation shortly after birth with a mistaken diagnosis of mechanical obstruction. That might not seem to be too bad a thing, but several facts should be remembered. First of all, the reported mortality in aganglionic megacolon in the newborn was between 70% and 80%. If one added to the child's problem an unnecessary exploration, that figure would be even higher. Some would say that that was a very rare disease; but actually, while it was rare in older children, it was not so rare as one would anticipate in the newborn. The simple fact was that it had not been recognized. It had not been realized that the disease in the newborn and in the first year of life could be entirely different from what one was used to in the older child. As reports had become available, it had become apparent that that form of intestinal obstruction was one of the commoner problems that one encountered in the newborn. In some of the series, the only lesion that exceeded it in frequency was malrotation; intestinal atresia was outdistanced by that disease. Thus it was of great practical importance for physicians particularly interested in children and newborn infants to realize what those patients appeared like in the neonatal period, and how they behaved during the first year of life.

Professor Swenson went on to say that, having realized that one could not make the diagnosis in that group of patients by a history and a physical examination, it had been thought that careful radiological examinations would elucidate the problem. Unfortunately, however, in the newborn one could not distinguish between large and small intestine with any degree of accuracy on a plain film; one had to perform a barium enema X-ray examination, and if the colon turned out to be a small microcolon, one could rest assured that that patient had a small bowel obstruction and that exploration should be undertaken. It was a rule at his hospital that no child was to be subjected to operation for intestinal obstruction without a barium enema X-ray examination. That was to prevent unnecessary operation on children with aganglionic megacolon; it had the additional advantage of outlining the colon and relieving the surgeon of the necessity of exploring it during the operation. It was surprising how frequently mistakes were made. The investigation was a very simple one, and yet was neglected time and again. Those who were in consultant positions with regard to the management of newborn problem infants should have that particular little trick in mind, to prevent unnecessary operation on a child that really did not need an immediate exploration.

Professor Swenson finally said that, while it was possible by barium enema X-ray examination to distinguish between mechanical obstruction and aganglionic megacolon, unfortunately there were two other conditions that mimicked the classical X-ray configuration. The first was exemplified by the case of a child who had languished in the surgical wards for several days, until a physician came along and asked why a child with hypothyroidism was in a surgical bed. It had also been recorded in other places how hypothyroidism, for a reason that he could not explain, not only produced the clinical signs and symptoms of aganglionic megacolon, but might even produce the X-ray appearances. The other condition that mimicked aganglionic megacolon was the so-called "meconium plug syndrome".

DR. F. STEPHENS, in opening the discussion, said that Professor Swenson had to be thanked for the whole new concept of the disease. In large maternity hospitals one frequently saw an infant with a distended abdomen on the second, third or fourth day of life. Those infants had often had a difficult birth or been born of toxæmic mothers. The colon was often irrigated for a few days in the hope that the condition would settle down, and subsequent follow-up examination showed the patients to be perfectly normal. Dr. Stephens asked Professor Swenson whether he would perform a biopsy forthwith in such cases, or whether he would be happy simply to do his best to get the baby through the first fortnight or so before undertaking diagnostic measures.

Professor Swenson, in reply, said that he quite agreed that many of the babies in the group described by Dr. Stephens did perfectly well with irrigation only. However, the group that he had in mind was that in which irrigation was insufficient, and in which the question of a mechanical obstruction and of the need for immediate laparotomy arose. He wished to emphasize that it was in that group that a barium enema X-ray examination was a prerequisite to exploration. Usually, once that examination had demonstrated a probable aganglionic megacolon, it was found that with persistent irrigation the condition could be brought under control; when that had been achieved, a biopsy could be done. However, occasionally one was still forced to establish a colostomy, and when that happened, he usually obtained a biopsy at operation and proceeded on the results of examination of a frozen section. In some patients he thought that there was a mechanical component to the obstruction, produced by the dilated sigmoid's falling down into the pelvis and thus producing an acute angulation.

DR. KATE CAMPBELL asked what was the likelihood that a premature infant, who had a distended abdomen in the first few days of life, but who subsequently made good progress, would be shown at a later date to have Hirschsprung's disease. She also asked whether Professor Swenson would hesitate before undertaking a barium enema X-ray examination or a rectal biopsy in a premature baby weighing only three or four pounds.

Professor Swenson replied that all the ordinary rules had to be largely discarded when one was dealing with the premature infant. It was very easy to make mistakes in that group, and one had to be extremely careful and patient. However, that policy could be carried too far, and

he had had the experience of coasting along a premature infant, only to be informed six months later that he had missed the diagnosis of congenital megacolon. It was a question of clinical judgement in deciding which patients to investigate.

## Obituary.

### HUGH BERCHMANS DEVINE.

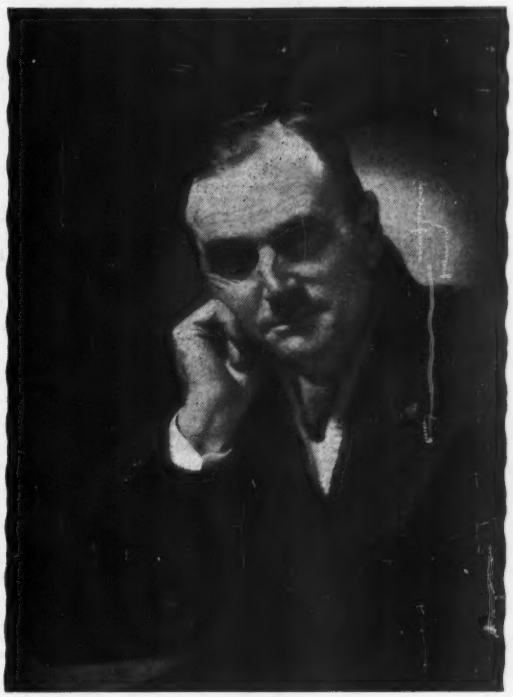
SIR HUGH DEVINE, who died in Melbourne on July 18, 1959, was a great surgeon and was acknowledged as such both in Australia and overseas. A measure of the appreciation of his colleagues in Australia may be seen in the fact that the August number of *The Australian and New Zealand Journal of Surgery* for this year has been called the Hugh Devine Number. It contains, in addition to direct tributes, a number of indirect tributes in the form of articles contributed by invitation by a number of distinguished surgeons and others both from Australia and from overseas. Sir Hugh knew of this special number of the journal and was looking forward to its publication, but his death came before the journal appeared. However, it stands, in the words of the President of the Royal Australasian College of Surgeons, Mr. Douglas Miller, as a sincere tribute from the College to the memory of a great man of surgery.

Hugh Berchmans Devine was born eighty-one years ago, being a son of the late John Devine of Little River, Victoria, and was educated at St. Patrick's College, Ballarat, and Queen's College in the University of Melbourne. He graduated in medicine and surgery in 1907, receiving the Beaney Prize in Surgery. He then became a resident medical officer at the Melbourne Hospital and for a time was the Acting Superintendent of the hospital. Then, under the influence of Sir Thomas Dunhill, he joined the staff of the young St. Vincent's Hospital and had a share in the development of its clinical school, which came into being soon afterwards. In 1911 he went abroad and studied in Vienna, the United Kingdom and America before returning to Melbourne and setting up practice as a surgeon. He obtained the degree of Master of Surgery of the University of Melbourne in 1913. He then moved forward steadily in the surgical world with increasing distinction until he reached a position in the front rank, which he maintained throughout his life. He made important contributions to surgical technique and teaching, and his originality and soundness of thought find permanent record in a series of notable books and articles. He made important contributions to the development of St. Vincent's Hospital, both as a hospital and as a teaching school, and eventually became Dean of the Clinical School and an honorary consulting surgeon to the hospital. The list of honours heaped upon him is long and included the following: Honorary Fellowship of the Royal College of Surgeons of England; Fellowship of the Royal Australasian College of Surgeons; Honorary Fellowship of the American College of Surgeons; Honorary Fellowship of the Association of Surgeons of Great Britain and Ireland; Honorary Fellowship of the Royal Society of Medicine and of the Proctological Society of that Society; Honorary Fellowship of the Greek Surgical Society; Honorary Fellowship of the International College of Surgeons; Honorary Surgeon to the Duke of Gloucester while he was Governor-General of Australia.

Sir Hugh Devine played a notable and indeed a decisive part in the formation of the Royal Australasian College of Surgeons, of which he later became President, and in the founding of the journal of the College, which some years later adopted its present title of *The Australian and New Zealand Journal of Surgery*. In 1936 he was created a Knight Bachelor. He was predeceased by both his wife and his son, Dr. John Devine. The death of the latter when he appeared to be on the threshold of an outstanding surgical career brought great sorrow to his father. Sir Hugh had had high hopes for his son, and it was not an easy blow to bear. However, he did bear it and maintained an active interest to the end of his life in the things that had meant so much to him and to which he had made such a fine contribution. He was active almost to the end, and his final illness was short. We extend our sympathy to his two daughters who survive him.

DR. JOHN HORAN, Dean of St. Vincent's Hospital Clinical School, Melbourne, writes: In 1928, at the annual meeting of the British Medical Association held at St. Vincent's Hospital, Sir Hugh Devine was demonstrating a gastrocolic fistula. The patient was lying on a couch in the demonstration room; beside him stood Sir Hugh, cigar in hand—something very unusual for him. In his other hand he held a rubber tube, into which at intervals he blew cigar smoke. At intervals the patient belched cigar smoke. It was then seen that the rubber tube was connected to a bottle, and that this led eventually to a rectal tube. This simple demonstration was a dramatic example of the originality of his mind, an originality that was brought to bear on the surgical problems which confronted him.

Sir Hugh always looked for the simple method. On one occasion, after acceding very unwillingly to a request for nephropexy in a patient with a floating kidney and a variety of symptoms which included loin pain, he must have doubted the then accepted value of this operation, as he spent several minutes isolating branches of the cutaneous nerves to the loin before exposing the kidney. These he crushed as he was sewing up the abdominal wall, remarking as he did so that this would produce anæs-



thesia of part, at least, of the patient's abdominal wall. He was a master of the art of exposure, and he used every device to improve it. It was this which made even the most difficult operations seem simple in his hands. In abdominal operations he tilted the table to one side or the other during the operation so that the bowel fell away from the field of operation, or he lowered the foot so that the contents of the upper part of the abdomen were brought closer to his hand. He spent considerable time at the beginning of an operation defining the field of operation, and used gauze packs—which he called "scarves" and the largest of them "the wedding-veil"—with which he packed off the intestines. For this purpose, too, he designed, and over the years perfected, an operating frame with retractors to hold open the abdominal wall during the operation. The retractors were held in place by the muscles of the abdominal wall, and their pressure was distributed evenly over the abdominal incision. The frame could be fitted with smaller retractors and used for operations on other cavities such as the mouth, or on the perineum in abdomino-perineal resections.

As an operator, Sir Hugh Devine avoided any unnecessary movements, worked fast and dexterously. His technique was such that convalescence in his patients was noticeably uneventful. He made the widest use of his instruments, which he handled adroitly. His movements were precise, a pleasure to watch, whether he was

dissecting with his spade-nosed scissors, whether he was sewing up the abdomen with the help of a special goose-necked forceps carried in the palm of his left hand and referred to as "My Swiss", or whether he was searching the mucous membrane of the stomach for a bleeding point with a sigmoidoscope introduced through an incision in the anterior wall of the stomach after the stomach had been "vacuum-cleaned". When he depended on his fingers alone during an operation, he exercised great care in handling tissues. For instance, his treatment of cardio-spasm in the 1920's was simple, yet effective and modern; very slowly and "ever so gently the cardia was dilated from the stomach first with two fingers, then three and finally four". Believing as he did that disturbed motor function of the stomach produced distinctive symptoms, he sometimes applied this same method of dilatation to the pylorus when he did not consider that the findings at operation were sufficient to account for all of the patient's symptoms. Sir Hugh Devine's judgement was founded on his own experience. An example of this was his once declining to do a gastrectomy for duodenal ulcer on a rather young patient who had a small stomach which showed vigorous peristalsis and emptied rapidly during barium meal examination. When pressed for his reasons for not doing a gastrectomy, he gave the laconic reply: "Stomach too small." This also illustrates his ability to reduce a problem to its simplest terms. This faculty, with his singleness of purpose in the pursuit of an idea and his ability to take the long-range view, was invaluable in discussions on policy in the many committees on which he sat.

He had the stamina which is so necessary in a surgeon who spends long hours at the operating table. The late Leo Doyle told the story of his returning late one evening after the theatre to the garage where he parked his car, and seeing Sir Hugh having his car filled with petrol. Sir Hugh told him that he was going to a country town over 100 miles from Melbourne to operate on a patient with an acute abdominal condition. Leo Doyle said that the next morning, when he went into the operating theatre at 9 a.m., Devine was half-way through the first case on his operating list for the day.

His active mind did not allow him to have thoughts of retiring after reaching sixty years, and, gathering strength with the years, he improved his public speaking, became president of the Royal Australasian College of Surgeons which he had helped to found, continued as chairman of the editorial committee of *The Australian and New Zealand Journal of Surgery*, became the Chairman of St. Vincent's Hospital School of Medical Research on its foundation, returned to the staff of St. Vincent's Hospital for the duration of the war, and continued to manage an extremely busy private practice. During this time he learnt German and finally wrote two books. One, "The Surgery of the Alimentary Tract", which was published in 1940 and contained almost 700 original illustrations, was rich in original thought and method. The other book was written in conjunction with his son, the late John Devine. One colleague who read his text-book said that it was "just as if Hughie were talking"—and that was exactly the way in which the book was written; he dictated it into a dictaphone and subsequently had it typed. Much of the book was written at his seaside home at Flinders, where he spent his holidays and an occasional week-end. To this house, which overlooked Bass Strait and Westernport Bay, he repaired each year before Christmas, and remained there for six weeks. He referred to this time as the "diastolic pause" which he considered necessary to the life of a busy doctor.

He was interested in the doings of others, and always had time to stop and talk for a moment even on the busiest of days. His outdoor interests were fishing, sailing and golf; he was also an expert shot, and sometimes, when called in consultation to the country, he would take his gun with him in the car for the sake of a chance shot on the way. His mode of life was conventional and offered nothing to caricature, as generations of students can testify.

The great blow he suffered in the death of his only son in the prime of life was met with characteristic fortitude.

He was an artist in an age when perfection in surgical technique was at its zenith. *Quando ullum invenient parem?*

DR. F. J. COLAHAN writes: Sir Hugh Devine, practising in an era before present-day extreme specialization became established, was in every sense a true general surgeon. Working at a period when such ancillary aids as the antibiotics and controlled anæsthesia with relaxants were unknown, he devised and perfected various mechanical techniques in operating. The abdominal retractor which bears his name was an improvement on the various types which were already in use and, with the aid of differently shaped "hands" and scarves, permitted perfect exposure of the operation field. He was exceedingly adept in using this retractor, and never ceased to demonstrate its various uses for different regions of the body, as distinct from the abdomen. Another favourite instrument was the "spade" scissors, which were bevelled and sharped like a chisel at its end, and which he used for dissections in preference to the scalpel.

He was a most skilful and intrepid operator, and achieved an international reputation. His operating sessions at St. Vincent's Hospital attracted overseas and interstate visitors, who were always impressed not merely by his skill, but also by the diversity of the cases and the enormous lists presented.

He was always ready to acknowledge those from whom he received advice or help, or from whom he learnt some point in technique. Frequently when operating he would remark: "I learnt this from watching Sir Alexander MacCormick"; or "Now Professor Watson (of Adelaide) showed me the way to do this".

It was at his operative sessions that he excelled as a demonstrator and teacher, for in his more formal ward clinics he lacked the gift of properly expressing his thoughts. It always seemed that his mental processes outpaced his ability of expression. Nevertheless, his clinics were always crowded with students, in whom he always took a keen personal interest.

Besides carrying on a very large surgical consulting practice, he was a prolific writer, producing two text-books on abdominal and gastro-intestinal surgery, besides numerous contributions to the medical journals of Great Britain and America as well as Australia. His work in helping to found the Royal Australasian College of Surgeons and its journal of surgery is well known and appreciated. It was only his superb physique and physical fitness that enabled him to accomplish all that he did—a fitness that he fostered by regular holidays, and week-ends at his house at Flinders, and by being a lover of all kinds of sporting activities, mainly tennis, golf, shooting and, above all, sailing his boat in Western Port.

Although intent and single-minded in the pursuit of his chosen profession, he had a keen sense of humour, and had the greatest sympathy and kindness towards his patients, especially the aged. His work on hospital committees, boards and research departments, as well as his surgical work and writings, certainly made him a remarkable example of that now fast-disappearing member of society, the true general surgeon. Sincere sympathy is offered to his daughters, Mrs. E. Gleeson and Miss Joan Devine.

## HENRY KENNETH FRY.

WE are indebted to Dr. A. R. Southwood or the following account of the career of the late Dr. Henry Kenneth Fry.

Dr. Kenneth Fry died at his home at Waverley Ridge, Crafers, South Australia, on July 22, 1959. He was born in 1886 at Adelaide, and educated at Prince Alfred College in that city. He was a successful student, and proceeded to the University of Adelaide, gaining his science degree in honours physiology in 1905, and qualifying in medicine and surgery in 1908. In 1909 he was awarded a Rhodes Scholarship. At Oxford he continued his studies in physiology and in anthropology; in 1912 he gained the degree of bachelor of science, and the diploma in anthropology. He also received the diploma in public health.

He entered the Northern Territory Medical Service in 1913, but left that work in 1914 to join the Australian Imperial Force for war service abroad. He served with distinction in the Australian Army Medical Corps, being mentioned in dispatches four times and admitted to the Distinguished Service Order. He reached the rank of lieutenant-colonel.

On returning to Australia after five years on overseas duty, Fry took up practice in Adelaide, and was soon firmly established as a general physician. From his student days he had proved himself a leader, capable and conscientious, and meticulous to a fault. He was appointed an assistant physician on the staff of the Royal Adelaide Hospital in 1920, and was promoted to full honorary status in 1935. He gained the degree of doctor of medicine in the University of Adelaide 1934, and was admitted to fellowship of The Royal Australasian College of Physicians.

Dr. Fry was a man of high ideals, and filled several offices giving him opportunities of community service. He was a quiet and devoted worker in many good causes, a sound administrator, efficient and never flamboyant. For over twenty years he held the post of Medical Officer of Health for the City of Adelaide, while also carrying out his work as a physician-consultant in private practice. He was much interested in psychiatry, and was an honorary official visitor to the State Mental Hospital at Parkside (Adelaide). Besides being a clinical teacher in the Medical School of the University of Adelaide for the major part of his professional life, he lectured in the subject of materia medica and therapeutics for 20 years, and wrote a small text-book on that subject.

By courtesy of *The Advertiser*.

He had wide scientific interests, and was especially devoted to anthropology. He was president of the Royal Society of South Australia in 1938; he was a member of several scientific expeditions to Central Australia, organized by the University of Adelaide.

In his public health duties, as in everything he undertook, Fry was a sincere, enthusiastic and tireless worker. Soon after taking up the position of Medical Officer of Health for the city, he formulated plans for the establishment of a mass X-ray service by the city authorities. He was given full support for that project, and through his efforts people were able at nominal cost to obtain an X-ray examination of the chest by the miniature method. Later the city X-ray survey unit was incorporated in the mass X-ray scheme conducted by the State Department of Public Health; but it was Fry who began the mass radiological examination of civilians in South Australia, and whose careful planning assured the success of that work from its inception.

He was a member of several Government bodies—the Advisory Committee on Food and Drugs, the Committee for Water Supplies Examinations and the National Fitness Council. He was also a member of the local examining board for the Royal Society of Health, and a Fellow of the Royal Institute of Public Health and Hygiene.

Fry applied for posting in the second Australian Imperial Force, and was bitterly disappointed that the city authorities took steps to have his services retained for their work. As a consulting physician he gave part-time service to the Army.

Dr. Fry married Miss Dorothy Deeley, of Adelaide. Mrs. Fry and their son and daughter survive him. In their sorrow they may derive some consolation from the fact that he has left with all who knew him a memory of one devoted to duty as he saw it, and of a conscientious worker in the interests of the profession he loved and the citizens he served. Than that, what better memorial?

## Out of the Past.

*In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.*

### SYDNEY HOSPITAL FOR SICK CHILDREN.

IMPROVED TREATMENT FOR DIPHTHERIA.[1]

[From the *Australasian Medical Gazette*, April 24, 1897.]

THE annual general meeting of the benefactors of and subscribers to the Sydney Hospital for Sick Children was held on April 12. Lady Hampden presided.

The annual report, which was taken as read, stated that in the general hospital there were admitted 475 patients, making with the 45 remaining from the previous year a total of 520 patients under treatment. Of these 411 were discharged cured or relieved, 28 were discharged incurable, 42 died, and on 31st December there were 39 remaining in hospital. In the diphtheria cottage there were admitted 177, making, with the 12 remaining from the previous year, a total of 189 patients under treatment. Of these 150 were discharged cured, 34 died, and on 31st December there were 5 remaining in the wards.

There were 6512 attendances of 2204 outpatients. Comparison with the statistics of the preceding year showed that the total number of inpatients treated was almost the same, and tended to confirm what was said in last year's report as to the institution having almost reached its limit as far as the present premises were concerned. The death rate in the general hospital for the year was 8·73 per cent., which was somewhat lower than that of the preceding year. The death-rate in the diphtheria wards was 18·42 per cent., which is the lowest ever recorded therein, the great improvement being of course due to the establishment of the anti-toxin treatment. There was a death-rate of 47 per cent. in 1894.

The medical officers' report stated that amongst the 112 cases of simple diphtheria there were only eight deaths, so that the death rate in these uncomplicated cases was only 7·1 per cent. The treatment by anti-toxin continued to be highly satisfactory. It was, however, very expensive if the best serum was used, and was a great tax on the funds of the hospital. More children could be treated at this hospital if only the convalescent cases could be taken away. They could not be sent home while they were infectious, and yet by keeping them urgent cases had sometimes to be refused because there was no room.

## Correspondence.

### MEDICAL MATTERS AND THE PRESS.

SIR: It is interesting to speculate as to why the universally accepted and widely practised techniques used throughout the world during the past four years in the treatment of Parkinson's disease should continually be used in newspapers of this country for the blatantly open or thinly veiled advertisement of certain neurological teams and institutes. Never have ethics in this respect fallen to a lower ebb in our community. Publicity in the Press—of the most cheap type, on the radio and on the television repeatedly continue to depress the standard of medical ethics, and offend against all professional susceptibilities. It is difficult to understand the subtle difference between blatant personal advertisement and journalistic accounts of the work of this or that specialist in a specified hospital. Hospitals are in essence

[1] From the original in the Mitchell Library, Sydney.

doctors and should be subject to the ethics respected by doctors. It is impossible for hospitals or surgeons to emancipate themselves from the responsibility for articles written in an operating theatre, describing techniques, and reporting conversations and results, and above all the making of unfavourable comparisons with other workers. The imagination of the lay journalist is not supernatural.

The conscience of a profession honoured over the years for its restraint from vulgar publicity must revolt against this kind of thing.

Strong strictures were recently passed on the President of the Royal College of Surgeons in England for publicity of a very circumspect and dignified kind compared with this, and at least justified by the high purpose of raising funds for a great and beneficent institution.

It is time, Sir, that the official leaders and official organ of the profession in Australia registered disapproval of this degrading business in the most forceful manner. A good wine needs no bush, so let us live according to the traditional British ethics of our fathers.

Yours etc.,

149 Macquarie Street, Sydney.
October 9, 1959.

DOUGLAS MILLER,

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SIR: A recent article featured in the lay Press on an operation for Parkinson's disease—the second of its kind in about a year—prompts me to protest vigorously about the propriety of such publicity. The article is entirely uncritical, makes a Hollywood drama out of a routine procedure and, by the art of omission of facts, could lead to many misconceptions in the mind of the reader. The implication is, in effect, that there is only one operation worth doing and but one place where it can be performed. May I, therefore, request space in the proper medium of the medical journal to correct at least some of the misconceptions that may have been generated.

Parkinson's disease has been treated surgically as a routine matter for some two years in every major hospital in Sydney and in most, if not all, similar institutions in each of our capital cities. The operation involves destruction of a nucleus in the thalamus or the globus pallidus either by chemicals or by diathermy coagulation. Chemical methods are more extensively employed in accredited centres the world over than diathermy, but the latter is equally satisfactory. The only difficulty in these otherwise simple procedures lies in assessing the area of destruction one is producing, and there is no proof that one method is surer or safer than the other—in fact, diathermy coagulation has been abandoned altogether in one English centre.[1] Both approaches are used throughout Australia, and in at least one hospital in Sydney both are regularly employed in order to make a critical comparison between the two.

The article reaches the height of bad form in making a comparison of an unfavourable nature to that most experienced New York clinic where this surgery originated and where the only really large series of patients has been treated. Finally, the application of the term "pioneer"—whatever the context—is really astonishing to those who know that this technique originated in 1908[2] and has merely been applied to suit a modern advance.

Surely, Sir, if the lay Press wished to publicize medical matters, it should do so in general terms, without bias and in a manner not resembling an advertisement.

Yours etc.,

149 Macquarie Street, Sydney.
October 14, 1959.

JOHN L. DOWLING.

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SIR: The recent publication in one of the daily papers of an article upon a medical subject calls for comment.

From a journalistic point of view the article was, I would imagine, an interesting one, which would have appealed to a journalist because it would have been appreciated by his readers. It did not need to contain material which turned it into an advertisement, and it did not need to contain statements which would not receive general agreement. Without these inclusions, it could have been just as informative and just as entertaining.

We live in times of change, much of which is exciting and beneficial, but are of necessity exposed to the constant danger of losing valuable traditions and manners which have taken centuries to establish. It is not unfair to claim that much of the dignity and honour upon which mainly the prestige of the medical profession rests are derived from British medicine and British medical manners. We must be careful to insist that all those who practise medicine here remember these things and observe them.

Yours, etc.,

149 Macquarie Street, Sydney.
November 5, 1959.

W. SCOTT CHARLTON.

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## INTRAVENOUS DENTAL ANÆSTHESIA WITH A PLEA FOR THE USE OF HEXABARBITONE.

SIR: Several months ago the Executive of the State committee of the Australian Society of Anæsthetists issued a memorandum, distributed with the monthly circular of the South Australian Branch of the British Medical Association, in which it stated: "Generally speaking, 'Pentothal' alone is unsuitable for dental anæsthesia." It has been brought to my notice that the memorandum has caused fellow general practitioners to become "jittery" in their approach to intravenous dental anæsthesia.

Having given, at a conservative estimate, at least 8000 intravenous dental anæsthetics, I am convinced that with reasonable care it is, for adults, the best form of dental anæsthesia at present available, and is eminently satisfactory as a sole anæsthetic in the vast majority of instances.

My own preference is for hexabarbitone ("Evipan" or "Cyclonal Sodium"), which I have used since 1934, and which has been superseded by thiopentone in general surgery. The value of hexabarbitone was particularly impressed upon me when it ceased to be marketed in Australia several years ago, and I was compelled to use thiopentone only. Direct negotiations with May & Baker Ltd. in London, however, enabled me to get supplies of "Cyclonal Sodium" through W. Ramsay (Surgical) Pty. Ltd.

For dental anæsthesia, the main advantages of "Cyclonal Sodium" over "Pentothal" are: (i) Respiration is much less depressed. (ii) Laryngeal spasm very much reduced. (iii) Less irritant to the tissues, if some anæsthetic should inadvertently escape beside the vein, or should accidental injection of an artery occur. "Cyclonal Sodium" is a considerably less profound anæsthetic, producing less relaxation, which is not so essential in dental operations as in general surgery. The keener retention of pharyngeal and laryngeal reflexes is an extra safeguard in cases when changing of the pack has been a little delayed and a little blood trickles past the pack. "Pentothal" is also more liable to cause headache.

The one big disadvantage of "Cyclonal Sodium" is that it is apt to cause restlessness, sometimes severe in hysterical teenagers, and this fact has undoubtedly been the biggest factor in its relegation. Nevertheless, it is a very valuable drug in dental anæsthesia, and also adds extra safety in general surgery on elderly patients where the restless factor is no longer appreciable.

The memorandum of the A.S.A. also stated under "Pentothal": "This is a sleep producing drug, and has little or no action in relieving pain or obtaining relaxation." When nearly half my patients refuse to believe they have been asleep after having had a number of teeth removed under intravenous anæsthesia, I seriously question the above statement. It is my custom to ask the patient to count slowly, with a breath between each count, during the induction stage. Usually a count of about 15 is reached. It has not been unusual to find a patient some time after operation counting 61-62, and convinced that he has not yet been unconscious. I have even had one of these patients roundly condemn me for not knowing my job and being unable to put him to sleep, when all the time he had had numerous teeth removed under very effective intravenous anæsthesia.

It is conceded that pain is sometimes registered in the subconscious mind, as illustrated by the following incident. An appreciable time after a dental clearance, under intravenous anæsthesia, a dentist discovered that a molar tooth had been left in the gum. This was extracted with a drawled comment from the patient: "You're rather rough, aren't you?" On regaining consciousness, this patient was one of many who thought they had not yet been anæs-

[1] McCaul, I. R., *J. Neurol., Neurosurg., Psychiat.*, 1959, 22: 109.

[2] Horsley, Sir Victor, and Clarke, R. H., *Brain*, 1908, 31: 45.

thetized, let alone having had any teeth out. He had absolutely no recollection of the above incident. What, then, constitutes relief of pain?

Up to date I can trace only two complications from my series of dental anæsthetics. (1) A venous thrombosis, which another practitioner, possibly correctly, but certainly uncharitably, told the patient was due to the anæsthetist using a dirty needle. (2) A local thickening of the tissues above the needle puncture—probably due to escape of anæsthetic beside the vein.

Laryngeal spasm has never been a bogy to me since being reassured that a patient cannot die in spasm. Laryngeal spasm is one of nature's protections for the lungs; it is an active thing, and you can no more die with laryngeal spasm than you can die with your fist tightly clenched. As long as the airway is clear, one need have no fear of laryngeal spasm.

The greatest hazard in anæsthesia is vomiting, which is rare in intravenous anæsthesia when used as a sole anæsthetic. Premedication with morphine, "Omnopon" or pethidine might, however, precipitate vomiting, and in any case is best avoided in ambulant cases.

The majority of my series of cases have been in the sitting position.

The introduction of "Transithal" has given us a shorter-acting intravenous anæsthetic, which I have found most useful in selected cases.

Yours, etc.,

104 Grote Street,
Adelaide, S.A.
October 20, 1959.

F. B. LEDITSCHKE.

# Notes and News.

## Symposium on Venereal Diseases.

The eleventh annual Symposium on Recent Advances in the Study of Venereal Diseases will be held on April 7 and 8, 1960, in The Palmer House, Chicago. The sessions will be open to all physicians and workers in allied fields who are interested in the venereal diseases. This symposium, sponsored jointly by the American Venereal Disease Association and the Public Health Service, will follow a Venereal Disease Seminar for public health personnel which begins on April 4.

Anyone wishing to present a scientific paper on a subject related to venereal diseases should send preliminary abstracts before November 25 to Dr. William J. Brown, Programme Committee Chairman, care of the Venereal Disease Branch, Communicable Disease Center, 50 Seventh Street, N.E., Atlanta 23, Georgia. Preliminary abstracts should give information sufficient to assist the programme committee in making a decision as to their acceptance or rejection. Authors of accepted papers will be notified before January 15. Final abstracts not exceeding 500 words will be required by March 1.

## Summer Camp for Diabetic Children.

The Association of Summer Camps for Diabetic Children announces that the annual camp will be held from January 10 to 24, 1960, at Mona Vale, N.S.W. Any diabetic boy or girl between the ages of six and 13 years is eligible to attend. A fully trained staff of dietitians, nursing sisters and helpers will be at the camp. Information may be obtained from the Honorary Secretary, Miss R. Pirie, c.o. Dietitian's Office, The Royal North Shore Hospital of Sydney, St. Leonards. Telephone: JF 0411, extension 302.

## Amendments to Quarantine Restrictions on the Importation of Pigs, Dogs and Cats.

Dr. the Honourable D. A. Cameron, Commonwealth Minister for Health, has announced amendments to quarantine restrictions on the importation of pigs, dogs and cats into Australia.

Dogs and cats from the Channel Islands may now be imported into Australia, subject to the same health requirements as apply to the importation of dogs and cats from Great Britain. However, to avoid the risk of bringing disease from the Continent, dogs and cats from the Channel Islands must be shipped to Australia from approved ports in Great Britain. Relaxation of the restriction on entry of these dogs and cats has followed only after careful inquiries, which have revealed that there has been no outbreak of rabies in the Channel Islands in living memory, and that their laws safeguard against introduction of rabies from the Continent.

For many years quarantine legislation permitted the importation of pigs from Ireland. But in March, 1958, it was necessary to ban further imports because of widespread outbreaks of swine fever in Ireland. Since the eradication of the disease by the authorities in Northern Ireland and the Republic of Ireland, no further outbreaks have occurred during the last year or so. The prohibition of imports is therefore no longer considered necessary, and amendments have been made to legislation to permit again the importation of pigs from those countries subject to prescribed health requirements.

## Rockefeller Foundation Grants.

The following are among the grants made by the Rockefeller Foundation for the third quarter of 1959.

Dr. L. I. Taft, hæmatologist, of the Department of Pathology, Royal Children's Hospital, Melbourne, has been given a grant of $1500, to enable him to visit pædiatric hæmatological centres in the United States of America.

The University of Adelaide has received a grant of $6500 for research in biochemistry, under the direction of Dr. E. S. Holdsworth, reader in biochemistry.

## Prize for a Medico-Surgical Film.

The annual prize awarded by *La Presse médicale* for a medico-surgical film, amounting to 100,000 francs (with the possibility of its being divided), and various other awards, will be presented during the last session of the course of *Actualités médico-chirurgicales* at the new *Faculté de Médecine de Paris* on April 5, 1960. The judges will consider the instructional value of the film as well as its properly cinematographic quality. Only film of 16 mm. size will be admitted. Entries and films should be sent before February 29, 1960, to the *Secrétariat du Journal La Presse médicale*, 120 Boulevard Saint-Germain, Paris VI°. Awards will be made to the authors of the best films. Contrary to conditions obtaining in previous years, all films are eligible for awards, including those subsidized or produced by a laboratory or firm.

# The Royal Australasian College of Physicians.

## ADMISSION OF FELLOWS AND MEMBERS.

AT a meeting of the general body of Fellows of The Royal Australasian College of Physicians, held in Canberra on October 16, 1959, Professor F. J. Fenner, of Canberra, A.C.T., was elected and admitted to Fellowship of the College under the special provisions of Article 44.

The following candidates, who were successful at an examination held in Australia, were admitted to Membership of the College on October 13, 1959: Dr. V. J. Barron, Dr. F. M. Elliott, Dr. Patrick Harvey, Dr. J. R. Johnson and Dr. D. W. O'Gorman Hughes, of New South Wales; Dr. John M. Court, Dr. E. A. Dodge, Dr. Joan M. Handley, Dr. W. C. Heath, Dr. H. Hillman, Dr. Ian Maddocks, Dr. David McCredie, Dr. E. N. O'Brien and Dr. G. I. Vidor, of Victoria; Dr. S. A. Birdseye and Dr. G. M. Kneebone, of South Australia; Dr. J. B. Cope, Dr. D. J. Hodges, Dr. L. W. L. Jackson and Dr. Miles Murphy, of Queensland; Dr. P. E. Hurst, of Western Australia; Dr. R. B. Langley, of New Zealand; Dr. H. O. Wong, of Singapore.

Dr. J. D. Reid, of New Zealand, and Dr. P. L. Bazeley, of Victoria, were admitted to Membership under the provisions of Article 37 on September 16 and October 13 respectively.

## EXAMINATIONS FOR MEMBERSHIP.

THE Examinations for Membership of The Royal Australasian College of Physicians in 1960 will be held on the following dates:

First Examination: Written examination (capital cities), Friday, April 8, 1960. Clinical examination (Melbourne), commencing on or about Wednesday, May 18, 1960.

Second Examination: Written examination (capital cities), Friday, August 26, 1960. Clinical examination (Sydney), commencing on or about Wednesday, October 5, 1960.

Application forms may be obtained from the Honorary Secretary, 145 Macquarie Street, Sydney, and applications should be lodged with the Honorary Secretary not later than Friday, March 11, 1960, and Friday, July 29, 1960, respectively.

# Royal Australasian College of Surgeons.

## FACULTY OF ANÆSTHETISTS.

### Final Fellowship Examination.

A MEETING of the Court of Examiners for the final examination for fellowship of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons will be held in Sydney, commencing on Friday, May 6, 1960. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Assessor for permission to do so, before March 24, 1960. The appropriate forms are available from the Examination Secretary of the Faculty, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1. Candidates who have already been approved by the Assessor, but who have not yet presented themselves for the examination, may do so for this examination, provided that they notify the Examination Secretary of their intention to do so by March 24, 1960. It is stressed that entries close on this day and late entries cannot be accepted. The examination fee is £26 5s., plus exchange on cheques drawn on banks outside Melbourne. The examination fee must be paid to the Examination Secretary by March 24, 1960.

Subjects for the final examination are: (*a*) anæsthesia and analgesia, including pre-operative and post-operative care; (*b*) medicine and surgery; (*c*) the application of the basic sciences, including chemistry and physics, to the specialty of anæsthetics. The examination in each case is partly written, partly oral and partly clinical (including the examination of patients).

Graduates of an approved medical school who have obtained, prior to December 31, 1957, the first part of the diploma in anæsthesia of an approved medical school or college, may, at the discretion of the Board, be allowed to present themselves for the final examination of the Faculty, provided they have fulfilled all other regulations.

### Meeting of New Zealand Fellows and Members.

New Zealand Fellows and Members of the Faculty of Anæsthetists of the Royal Australasian College of Surgeons will hold an annual scientific meeting in Dunedin on March 31 and April 1, 1960, in conjunction with the meeting being held by the Fellows of the College. A cordial invitation to attend is extended to Fellows and Members of the Faculty resident in Australia. Offers of scientific papers from Australia will be welcome. Full information may be obtained from the Honorary Secretary of the New Zealand Dominion Committee of the Faculty of Anæsthetists, Dr. A. A. Tennant, 11 Salamanca Road, Kelburne, Wellington, W.1, New Zealand.

## FINAL FELLOWSHIP EXAMINATION.

A MEETING of the Court of Examiners for the final examination for fellowship of the Royal Australasian College of Surgeons in general surgery will be held only in Sydney, commencing on Friday, May 6, 1960. Candidates who desire to present themselves at this examination should apply, on the prescribed form, to the Censor-in-Chief for permission to do so, before March 24, 1960. The appropriate forms are available from the Examination Secretary, Royal Australasian College of Surgeons, Spring Street, Melbourne, C.1. Candidates who have already been approved by the Censor-in-Chief, but who have not yet presented themselves for the examination, may do so for this examination, provided that they notify the Examination Secretary of their intention to do so by March 24, 1960. It is stressed that entries close on this day and late entries cannot be accepted. The examination fee is £26 5s., plus exchange on cheques drawn on banks outside Melbourne, and must be paid to the Examination Secretary by March 24, 1960. This examination will be conducted in general surgery only.

At its meeting held on June 20, 1958, the Council of the College decided that candidates who possess the fellowship of a body with which this College has reciprocity of primary examinations shall be exempted from the written part of the examination, provided that there is no relaxation of apprenticeship prerequisites.

# University Intelligence.

## UNIVERSITY OF NEW SOUTH WALES.

### Appointments to Foundation Chairs in the Medical School.

THE following appointments have been made to three of the foundation chairs in the Medical School of the University of New South Wales.

Dr. R. B. Blacket has been appointed to the Chair of Medicine. Dr. Blacket is a graduate of the University of Sydney, a Member of the Royal College of Physicians and a Fellow of The Royal Australasian College of Physicians. He is at present honorary assistant physician at the Royal Prince Alfred Hospital, and acting lecturer in medicine at the University of Sydney. He was formerly a Hallstrom Fellow in Cardiology of the Royal Prince Alfred Hospital. From 1947 to 1949 Dr. Blacket was clinical assistant to the medical unit at St. Mary's Hospital, London.

Dr. F. F. Rundle, who has been appointed to the Chair of Surgery, is a graduate of the University of Sydney and a Fellow of the Royal College of Surgeons. He is at present officer in charge and surgeon of the Unit of Clinical Investigation at the Royal North Shore Hospital of Sydney. In 1947 he held a Rockefeller Travelling Fellowship in the United States, and during the period 1948-1949 he was assistant surgeon to St. Bartholomew's Hospital, London. In February, 1955, Dr. Rundle received a grant from the N.S.W. State Cancer Council for social study of cancer patients and a long-term study of the pathology and treatment of cancer of the thyroid gland.

Dr. D. L. Wilhelm has accepted appointment to the Chair of Pathology. He is a graduate of the University of Adelaide, and holds the degree of doctor of philosophy of the University of London. During the second World War, Dr. Wilhelm served for four years with an Australian field ambulance unit. Since 1952, he has been a member of the scientific staff of the Department of Experimental Pathology at the Lister Institute of Preventive Medicine, London.

## UNIVERSITY OF MELBOURNE: APPOINTMENTS.

IN 1958 the Council of the University of Melbourne established the Chair of Child Health, to be known as the Stevenson Chair. Its first occupant will be Dr. V. L. Collins, who since 1949 has been Medical Director and Physician to In-Patients at the Royal Children's Hospital, Melbourne. Dr. Collins is a doctor of medicine and bachelor of surgery of the University of Melbourne, and also holds the Diploma of Child Health (London). He is a Member of the Royal College of Physicians, and a foundation member of the Australian Pædiatric Association. Before the second World War he gained post-graduate experience at the Royal Melbourne Hospital, the Royal Children's Hospital, Melbourne, and the Gresswell Sanatorium. From 1940 to 1946 he was physician at the North Middlesex County Hospital, London. After further work at pædiatric centres in England, he returned to Melbourne in 1946. Since then he has held several hospital appointments, has practised privately and has been a member of various consultative bodies on child health and care. He was president of the Pædiatric Society of Victoria in 1954. He has published a number of research papers and two books on nutrition. Professor Collins will carry out his main clinical practice and teaching at the Royal Children's Hospital, where he will also have the rank of in-patient physician. He will take up duty in 1960, after visits to research and teaching centres abroad.

Dr. Kate I. Campbell has been appointed part-time first assistant neonatal pædiatrician in the Professorial Obstetrical and Gynæcological Unit at the Royal Women's Hospital, Melbourne.

Dr. W. H. Kitchen has been appointed second assistant neonatal pædiatrician at the Professorial Obstetrical and Gynæcological Unit, Royal Women's Hospital, Melbourne.

The appointment of Dr. G. Berci as lecturer in experimental surgery in the Professorial Surgical Unit at the Alfred Hospital has now been made permanent.

Dr. S. Wiener has been appointed Lecturer in Pathology at the University of Melbourne.

## UNIVERSITY OF ADELAIDE.

### Degree of Master of Surgery.

THE University of Adelaide proposes to make a radical change in the nature of the degree of master of surgery. Under the existing regulations the degree is awarded to candidates who complete the examinations for Parts I and II. Part I consists of anatomy and physiology, and Part II includes the principles and history of surgery and a special branch of surgery selected by the candidate.

The new regulations, which have been approved by the University Council but have yet to receive the approval of the Senate of the University and of the Governor in Executive Council, dispense with the examinations, and require candidates to submit a thesis on some original research in the science or art of surgery. The degree will therefore become similar to the doctorate in medicine, except that candidates must submit evidence of having had special training in surgery, including at least two years in a teaching hospital. Subject to the approval of the Senate and the Governor in Executive Council, it is expected that the new regulations will come into force in 1960.

### Appointments to the Staff of the Medical School.

The University of Adelaide expects the following senior members of the staff of the Medical School to arrive shortly to fill newly-created positions.

Professor G. M. Maxwell will be the University's first Professor of Child Health. He holds the degree of doctor of medicine of the University of Edinburgh and is a Member of the Royal College of Physicians of London. Since 1958 he has been Assistant Professor of Pædiatrics in the University of Wisconsin, U.S.A. Professor Maxwell's department will be located at the Adelaide Children's Hospital.

Professor D. Rowley will occupy the Chair of Microbiology. He holds the degrees of doctor of philosophy and doctor of medicine of the University of London. He is at present head of the Department of Bacterial Physiology of the Wright-Fleming Institute of Microbiology, St. Mary's Hospital Medical School, London. In 1957-1958 he spent a year as Visiting Professor of Microbiology in Stanford University Medical School, California.

Dr. B. N. Catchpole will be Reader in Surgery, and will be stationed at the Royal Adelaide Hospital. He holds the degree of doctor of medicine of the University of Manchester and is a Fellow of the Royal College of Surgeons of England. He has held teaching appointments in the University of Manchester and the University of Sheffield.

# Australian Medical Board Proceedings.

## NEW SOUTH WALES.

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, in accordance with the provisions of the *Medical Practitioners Act*, 1938-58.

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (a) of the Act: Exton, William Dunham, M.B., B.S., 1940 (Univ. Queensland); Harrison, Jack Robert, M.B., B.S., 1951 (Univ. Queensland).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1) (b) of the Act: Dunlop, Isobel Muriel, M.B.,

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 17, 1959.[1] [2]

| Disease. | New South Wales. | Victoria. | Queensland. | South Australia. | Western Australia. | Tasmania. | Northern Territory. | Australian Capital Territory. | Australia. |
|---|---|---|---|---|---|---|---|---|---|
| Acute Rheumatism | .. | 4(3) | 2(2) | .. | 1(1) | .. | .. | .. | 7 |
| Amœbiasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ancylostomiasis | 1 | .. | 1(1) | .. | .. | .. | 10 | .. | 12 |
| Anthrax | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Bilharziasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Brucellosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Cholera | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Chorea (St. Vitus) | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| Dengue | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Diarrhœa (Infantile) | 3(2) | 22(17) | 2(1) | .. | 1(1) | 1 | .. | .. | 29 |
| Diphtheria | .. | .. | 1 | .. | .. | .. | .. | .. | 1 |
| Dysentery (Bacillary) | .. | .. | 1 | .. | 1(1) | .. | 2 | .. | 4 |
| Encephalitis | 1 | 1(1) | .. | .. | .. | .. | .. | .. | 2 |
| Filariasis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Homologous Serum Jaundice | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Hydatid | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Infective Hepatitis | 71(25) | 26(20) | 18(1) | 12(11) | 4(1) | .. | .. | .. | 131 |
| Lead Poisoning | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Leprosy | .. | .. | .. | .. | .. | .. | 1 | .. | 1 |
| Leptospirosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Malaria | .. | 1(1) | .. | .. | .. | .. | .. | .. | 1 |
| Meningococcal Infection | 2(1) | 2(1) | .. | 1(1) | .. | .. | .. | .. | 5 |
| Ophthalmia | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Ornithosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Paratyphoid | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Plague | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Poliomyelitis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Puerperal Fever | 1 | .. | .. | .. | .. | .. | .. | .. | 1 |
| Rubella | .. | 21(14) | .. | .. | 1(1) | .. | 5 | .. | 27 |
| Salmonella Infection | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Scarlet Fever | 7(4) | 18(8) | 3 | 3(3) | 1(1) | .. | .. | .. | 32 |
| Smallpox | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tetanus | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Trachoma | .. | .. | .. | .. | 307(1) | .. | 16 | .. | 323 |
| Trichinosis | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Tuberculosis | 17(9) | 17(12) | 32(27) | 2(2) | 8(2) | 4(2) | .. | .. | 80 |
| Typhoid Fever | .. | 1(1) | .. | .. | .. | .. | .. | .. | 1 |
| Typhus (Flea-, Mite- and Tick-borne) | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Typhus (Louse-borne) | .. | .. | .. | .. | .. | .. | .. | .. | .. |
| Yellow Fever | .. | .. | .. | .. | .. | .. | .. | .. | .. |

[1] Figures in parentheses are those for the metropolitan area.

[2] No case of notifiable disease was reported for the week ending October 17, 1959, in the A.C.T.

Ch.B., 1922 (Univ. St. Andrews), D.P.H., St. Andrews, 1924; Evans, David Wainwright, M.B., B.Ch., 1950 (Univ. Wales), D.C.H., England, 1955, M.R.C.P., London, 1958; Fairweather, David Keith, M.B., B.Chir., 1954 (Univ. Cambridge), M.R.C.S., England, L.R.C.P., London, 1954; Malleson, Nicolas Borrell, M.B., B.Ch., 1945 (Univ. Cambridge), M.R.C.P., London, 1950, M.D., 1957 (Univ. Cambridge); Silver, Albert, M.B., Ch.B., 1949 (Univ. Glasgow); Trevathasan, Arthur Wesly Sugunaratnam, L.M.S., Singapore, 1937, M.R.C.P., London, 1951.

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (2A) of the Act: Selecki, Edward Emanuel, M.D., 1951 (Univ. Cracow); Singer, Henrik, M.D., 1921 (Univ. Budapest).

The following has been issued with a Certificate of Regional Registration under Section 21A of the Act: Narkowicz, Stefan, in respect of Bundarra.

The following have been issued with a licence in accordance with the provisions of Section 21C (4) of the Act: Luedecke, Hans, for one year, from September 1, 1959; Kroll, Endel, for one year, from September 1, 1959; Szechowycz, Bodhan, for one year, from September 28, 1959; Chariw, Peter, for one year, from October 3, 1959; Staszkiw, Vladimir, for one year, from October 31, 1959; Malesevic, Bosko, for one year, from November 1, 1959.

The following have been issued with a licence in accordance with Section 21C (3) of the Act: Kowalski, Ignacy, for a period from September 15, 1959, to June 17, 1960; Tziniolis, John Anthony, for one year, from September 21, 1959.

## Notice.

### THE CHILDREN'S MEDICAL RESEARCH FOUNDATION OF N.S.W.

THE following is a list of donations to the Children's Medical Research Foundation of N.S.W. received from members of the medical profession in the period October 29 to November 3, 1959.

Dr. J. J. Gilchrist, Dr. and Mrs. F. H. Burns (further): £10 10s.

Dr. A. Brauner (further), Dr. E. J. T. Giblin (further), Dr. Edith Anderson, Dr. Neil Campbell (further), Dr. J. Zamel, Dr. H. C. Spencer: £5 5s.

Dr. P. D. Hipsley (further): £5.

Dr. and Mrs. D. G. Lampard (further), Dr. E. Harmelin: £2 2s.

Dr. Robert Hughes (further): £1 1s.

Previously acknowledged: £9582 6s. 4d. Total received to date: £9645 1s. 4d.

## Nominations and Elections.

THE undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

McDonnell, Desmond Leo, M.B., B.S., 1957 (Univ. Adelaide), 1 Eden Avenue, Kensington Park, South Australia.

Clezy, Trevor Munro, M.B., B.S., 1957 (Univ. Adelaide), 9 Dequetteville Terrace, Kent Town, South Australia.

Rutter, Margaret Claire, M.B. B.S., 1957 (Univ. Adelaide), Box 144, Angaston, South Australia.

Shepherd, Peter Byron, M.B., B.S., 1957 (Univ. Adelaide), 40 Hallett Road, Stonyfell, South Australia.

The undermentioned has been elected as a member of the South Australian Branch of the British Medical Association: Hensley, Annie Doreen, M.B., B.S. (Univ. Melbourne), M.D., 1923 (Univ. Melbourne).

## Deaths.

THE following deaths have been announced:

DALE.—Norman Roy Dale, on August 22, 1959, at Melbourne.

BOWMAN.—Amos Walter Bowman, on November 2, 1959, at Hawthorn, Victoria.

ADAMSON.—Charles Henry Bruce Adamson, on November 5, 1959, at Armadale, Victoria.

## Diary for the Month.

NOVEMBER 24.—New South Wales Branch, B.M.A.: Hospitals Committee.
NOVEMBER 25.—Victorian Branch, B.M.A.: Branch Council.
NOVEMBER 26.—New South Wales Branch, B.M.A.: Branch Meeting.
NOVEMBER 26.—South Australian Branch, B.M.A.: Scientific Meeting.
NOVEMBER 27.—Queensland Branch, B.M.A.: Council Meeting.
DECEMBER 1.—New South Wales Branch, B.M.A.: Organization and Science Committee 8 p.m. (with Special Groups 8.30 p.m.).

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

*New South Wales Branch* (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

*South Australian Branch* (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

## Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations, other than those normally used by the Journal, and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference to an article in a journal the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of article. In a reference to a book the following information should be given: surname of author, initials of author, year of publication, full title of book, publisher, place of publication, page number (where relevant). The abbreviations used for the titles of journals are those of the list known as "World Medical Periodicals" (published by the World Medical Association). If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors submitting illustrations are asked, if possible, to provide the originals (not photographic copies) of line drawings, graphs and diagrams, and prints from the original negatives of photomicrographs. Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

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